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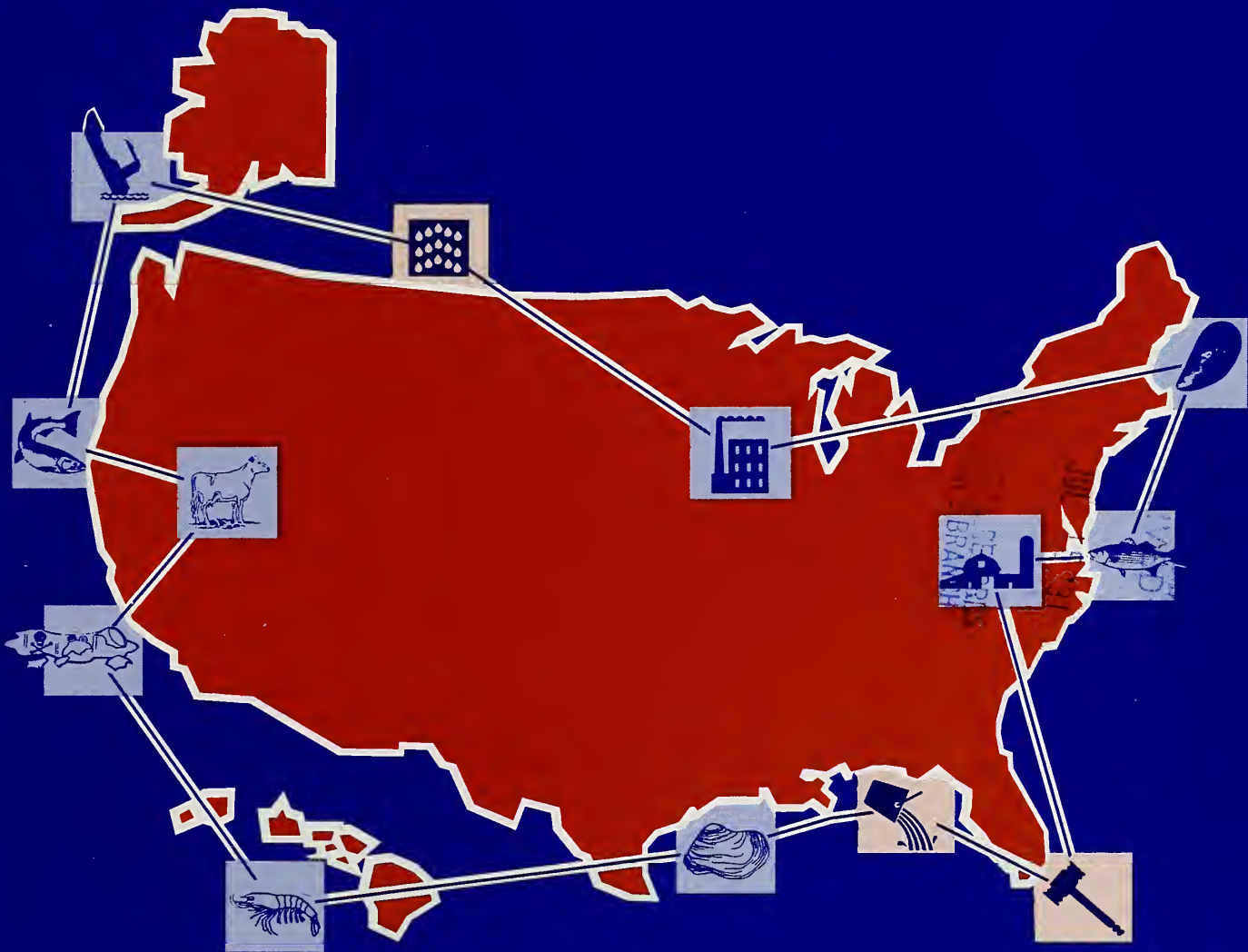
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Interactions of Aquaculture, Marine Coastal Ecosystems, and Near-Shore Waters: A Bibliography





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Interactions of Aquaculture, Marine Coastal Ecosystems, and Near-Shore Waters: A Bibliography

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Preface

This bibliography contains "selected" literature citations on the interactions of aquaculture and marine coastal ecosystems. The focus is on aquaculture effluents and their impact on marine coastal ecosystems and waterways as well as the impact of pollutants on aquaculture development. Factors affecting these issues include domestic and industrial wastes, thermal discharges, acid rain, heavy metals, oil spills, and microbial contamination of marine waters and aquatic species. Coastal zone management, environmental impact of aquaculture, and water quality issues are also included in this bibliography.

Two computerized databases were searched for citations to literature on this topic. They are 1) ASFA (Aquatic Sciences and Fisheries Abstracts) database, 1978-present, produced under contract to the Food and Agriculture Organization of the United Nations by Cambridge Scientific Abstracts (CSA) for a consortium of United Nations agencies and cooperating member states; and 2) AGRICOLA (AGRICultural OnLine Access), 1979-present, an agricultural database produced by the National Agricultural Library (NAL), U.S. Department of Agriculture. As a result, the format of the citations included in this publication may vary. ISSN and ISBN numbers are supplied for many of the cited documents. When available, the NAL Call Number is provided for materials located at the National Agricultural Library.

This publication is arranged alphabetically by author surname. An index to selected subjects and species is provided at the end of the bibliography.

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Acknowledgments

This informational product is a cooperative project of the U.S. Aquatic Sciences and Fisheries Information Systems (ASFIS) network of ASFA national centers and the University of Hawaii. It represents a collaborative effort of the Aquaculture Information Center of the National Agricultural Library (NAL), the National Environmental Satellite, Data, and Information Service (NESDIS) of the National Oceanic and Atmospheric Administration (NOAA), and the Hamilton Library of the University of Hawaii.

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1

Cage pollution equals sewage.

(Anon.)

Source: FISH FARMER, vol. 10, no. 2, p. 24, (1987).

Languages: English

Document Type: Journal Article

Abstract: The effects of organic waste from fish farms on the marine environment are discussed briefly.

Although the pollution load is great, effects are restricted to the immediate vicinity of the fish farm.

Descriptors: fish culture; marine pollution; cage culture; organic wastes

Environment: Marine; Fresh

2

Effect of zinc exposure on subsequent acute tolerance to heavy metals in rainbow trout.

Anadu, D.I.; Chapman, G.A.; Curtis, L.R.; Tubb, R.A.

(Anambra State University of Technology, Abakaliki, Nigeria)

Source: Bulletin of environmental contamination and toxicology. New York, N.Y.: Springer-Verlag. Sept. 1989, v. 43 (3), p. 329-336.

Languages: English

Report No.: ISSN 0007-4861

DNAL Call No.: RA1270.P35A1

3

Effects of radiation on aquatic organisms and radiobiological methodologies for effects assessment / S.L.

Anderson, F.L. Harrison; work performed under LAG DW 89930414-01.

Anderson, S. L.; Harrison, Florence L.

Source: United States.. Environmental Protection Agency.. Office of radiation Programs. Washington, D.C.:

U.S. Environmental Protection Agency, Office of radiation Programs. 1986, ix, 128 p., ill.

Languages: English

DNAL Call No.: TD427.R3A5

4

Long-term effects of bleached kraft mill effluents on carbohydrate metabolism and hepatic xenobiotic biotransformation enzymes in fish.

Andersson, T.; Bengtsson, B.E.; Forlin, L.; Hardig, J.; Larsson, A.

Source: Ecotoxicology and environmental safety. Duluth, Minn.: Academic Press. Feb. 1987, v. 13 (1), p. 53-60.

Languages: English

Report No.: ISSN 0147-6513

DNAL Call No.: QH545.A1E29

5

Present status and problems of mussel culture in India.

Appukuttan, K.K.

(Vizhinjam Res. Cent., Cent. Mar. Fish. Res. Inst., Vizhinjam, India)

Source: J. INDIAN FISH. ASSOC., vol. 18, pp. 39-46, (1988).

Languages: English

Document Type: JOURNAL ARTICLE

Abstract: Two species of mussels, the green mussel (*Perna viridis*) and the brown mussel (*P. indica*) were cultured using the seed collected from the natural beds of the east and west coasts of India. The results of culture experiments are consolidated and the present status is reviewed. Although the culture experiments gave encouraging results, problems such as mooring of rafts in highly turbulent coastal waters, large scale seed requirements, control of predation, legal problems and marketing of end products require urgent attention before undertaking commercial operations. Some of the major problems of mussel culture are outlined for formulating effective management policies and their implementation for commercial mussel farming in India.

Descriptors: mussel culture; aquaculture systems; aquaculture techniques; aquaculture development

Geographic Descriptors: India

Taxonomic Descriptors: *Perna viridis*; *Perna indica*

Environment: MARINE

6

Effects of the environmental pollutants on heme oxygenase activity and cytochrome P-450 content in fish.

Ariyoshi, T.; Shiiba, S.; Hasegawa, H.; Arizono, K.

(Nagasaki University, Bunkyo-cho, Nagasaki, Japan)

Source: Bulletin of environmental contamination and toxicology. New York, N.Y.: Springer-Verlag. Feb. 1990, v. 44 (2), p. 189-196.

Languages: English

Report No.: ISSN 0007-4861

DNAL Call No.: RA1270.P35A1

7

The social consequences of tropical shrimp mariculture development.

Bailey, C.

(Coll. Agric., Auburn Univ., Auburn, AL 36849-5406, USA)

Source: OCEAN SHORELINE MANAGE., vol. 11, no. 1, pp. 31-44, (1988).

Languages: English

Summary Languages: English

Document Type: Journal Article

Abstract: Tropical shrimp mariculture has become a focal point of coastal resource development over the past decade. Strong international demand, combined with static supplies of shrimp from capture fisheries, have made shrimp mariculture attractive to national leaders, international development agencies, and private sector entrepreneurs. In this paper the rapid development of shrimp mariculture over the past decade is briefly reviewed and the impact of this development on coastal ecosystems is discussed. The social consequences of shrimp mariculture development are examined with particular reference to resource allocation and property rights, the role of the state, and the marginalization of small-scale producers.

Descriptors: marine aquaculture; shrimp culture; aquaculture development; property rights; resource management; sociological aspects

Environment: Marine

8

Tributyltin (TBT) in the waters of a Scottish sea loch arising from the use of antifoulant treated netting by salmon farms.

Balls, P.W.

(DAFS Mar. Lab., P.O. Box 101, Victoria Rd., Aberdeen AB9 8DB, UK)

Source: AQUACULTURE, vol. 65, no. 3-4, pp. 227-237, (1987).

Languages: English

Summary Languages: English

Document Type: Journal Article

Abstract: The leaching of TBT from a moored array of cages with netting freshly treated with TBT-based antifoulants has been assessed for 5 months following immersion in seawater. Concentrations of ca. 1 mg/m super(3) (μ g/l as Sn) within the cages are observed soon after deployment. These levels dropped rapidly to ca. 0.1 mg/m super(3) after 2 weeks and to ca. 0.005 mg/m super(3) after 5 months. Close to the cages (20 m) concentrations up to 0.2 mg/m super(3) were initially observed whilst in the main body of the loch TBT was only detectable (0.002 mg/m super(3)) near the start of the investigation. Concentrations of TBT in seawater in and around the raft are higher than those reported to produce effects on biota in laboratory studies. Within the loch there is some evidence of decomposition of TBT to dibutyltin (DBT).

Descriptors: antifouling substances; coating materials; leaching; salmon fisheries; cage culture

Geographic Descriptors: ANE, British Isles, Scotland

Environment: Marine

Identifiers: tributyltin; dibutyltin

9

Better land use through brackishwater aquaculture in coastal monocropped areas. Symp. on the Impact of Current Land Use Pattern and Water Resources Development on Riverine Fisheries (Barrackpore (India)) 25-27 Apr 1987

Bandyopadhyay, A.K.; Biswas, C.R.; Chattopadhyay, G.N.; Ghosh, A.; Chakraborti, P.K.

(Cent. Soil Salinity Res. Inst., Regional Res. Stn. (Canning, 24-Parganas (South), West Bengal, Pin-743 329, India; Central Inland Capture Fisheries Research Inst., Barrackpore (India))

Source: SYMPOSIUM ON THE IMPACT OF CURRENT LAND USE PATTERN AND WATER RESOURCES DEVELOPMENT ON RIVERINE FISHERIES. APRIL 25-27 1987. ABSTRACTS. (1987), p. 11. Summary only.

Languages: English

Document Type: CONFERENCE; SUMMARY; BOOK

Abstract: Studies conducted for 5 years in coastal monocropped rice areas in India, revealed that increased harvest index could be achieved through better land and water use. Additional yields of brackishwater fish during summer periods and freshwater fish along with kharif rice as well as vegetables from the field bunds are possible instead of only one rice cultivated at present. Yield of kharif rice did not decline due to brackishwater aquaculture. Soil salinity developed due to saline water introduction in summer could be lowered down through leaching and run-off processes with the help of pre-kharif precipitations. This method of cultivation resulted in much higher economic returns from the low lying rice fields of coastal saline soil areas.

Descriptors: brackishwater aquaculture; rice field aquaculture; fish culture; aquaculture systems; agropisciculture; salinity data; aquaculture economics

Geographic Descriptors: India

Environment: BRACKISH

10

Aquaculture and coastal zone management in Bangladesh.

Bashirullah, A.K.M.

(Inst. Oceanogr., Univ. Oriente, Cumana 6101, Venezuela)

Source: COAST. MANAGE., vol. 17, no. 2, pp. 119-127, (1989).

Languages: English

Summary Languages: English

Document Type: JOURNAL ARTICLE

Abstract: This article gives a brief survey of the present status of brackish water shrimp culture and its increased importance in the economy of Bangladesh. The high and increasing population density is forcing people to engage in agriculture and aquaculture in low lying coastal areas where they are exposed to cyclones and tidal floods. Colonization of these areas has, however, led to deforestation and other adverse effects on the ecosystem. A policy of intensive farming using the most modern methods is necessary to reduce these effects. It is proposed that the government augment its present policy of reforestation and take other steps to conserve the environment and to reduce siltation and erosion.

Descriptors: coastal zone management; aquaculture; shrimp culture

Geographic Descriptors: ISW, Bangladesh

Environment: MARINE; BRACKISH

11

Effects of a tanker accident and an oil blowout in Bristol Bay, Alaska, on returning adult sockeye salmon (Oncorhynchus nerka) --a simulation study.

Bax, N.J.

(NMFS, Northwest and Alaska Fish. Cent., Resour. Ecol. Fish. Manage., 7600 Sand Point Way NE, Build. 4, Seattle, WA 98115, USA)

Source: MAR. ENVIRON. RES., vol. 22, no. 3, pp. 177-203, (1987).

Languages: English

Document Type: Journal Article

Abstract: The effects of a tanker accident releasing 34,000 tons of diesel fuel and a blowout releasing 3000 t/day of crude oil on adult sockeye salmon (*Oncorhynchus nerka*) returning through Bristol Bay, Alaska, were simulated. Parameters were chosen to maximize possible effects of the oil. Mortalities were predicted to range from 2% to 18% of the adults passing through the spill area or 1% to 5% of the total returning population. From 3% to 7% of the adults surviving migration through the spill area, or 1% to 2% of the total population, could be tainted at or above 0 multiplied by 6 ppm of hydrocarbons in the flesh. As many as 30% of the adults returning to fishing grounds closest to the spill area could be tainted. Effects of the blowout on returning salmon were less severe than those of the tanker accident, with mortalities reaching a maximum of 0 multiplied by 2% of the adults passing through the area of the blowout, and no tainting predicted above 0 multiplied by 6 ppm.

Descriptors: simulation; tanker ships; oil spills; blowouts; accidents; anadromous species; pollution effects; crude oil; fuels

Geographic Descriptors: INE, Bristol Bay

Taxonomic Descriptors: *Oncorhynchus nerka*; salmonidae; Pisces

Environment: Marine

12

*PCB effects on production of carbohydrates, lipids and proteins in marine diatom *Phaeodactylum tricornutum**

Bazulic, D.; Najdek, M.; Pavoni, B.; Orio, A.A.

Source: Comparative biochemistry and physiology: C: Comparative pharmacology and toxicology. Oxford:

Pergamon Press. 1988, v. 91 (2), p. 409-412.

Languages: English

Report No.: ISSN 0306-4492

DNAL Call No.: QP901.C6

13

Aeration method investigations in a red mangrove dominated mosquito control impoundment. Symposium on coastal water Resources Wilmington, NC (USA) (1988).

Belanger, T.V.; Heck, H.H.

(Dep. Chem. and Environ. Eng., Florida Inst. Technol., Melbourne, FL 32901-6988, USA)

SOURCES: TECH. PUBL. SER. AM. WATER RESOUR. ASSOC.; PROCEEDINGS OF THE

SYMPOSIUM ON COASTAL WATER RESOURCES. Lyke, W.L.; Hoban, T.J., eds. 1988, pp. 299-312.

Languages: English

Summary Languages: English

Document Type: CONFERENCE; BOOK

Report No.: TPS-88-1

Abstract: Mosquito control impoundments cover 30,000 acres of saltmarsh habitat on the east central coast of Florida. Many of the impoundments are characterized by low dissolved oxygen and periodic fish kills. The first step, therefore, before site specific fish growth and survivability studies are implemented, is to investigate aeration methods necessary to guarantee fish survival. Five aeration systems were investigated in this study in field and tank tests. The propeller-aspirator aerator was found to be the most efficient method in terms of energy and oxygen transfer, and was very effective in reducing column sulfide and COD levels.

Descriptors: salt marshes; brackishwater aquaculture; pest control; habitat improvement (physical); aeration; oxygenation; impoundments

Geographic Descriptors: ASW, USA, Florida

Environment: MARINE; BRACKISH

14

Effects of pulp mill effluents on skeletal parameters in fish--a progress report.

Bengtsson, B.E.;

Source: Water science and technology: A journal of the International Association on Water Pollution Research. Oxford: Pergamon Press. 1988, v. 20 (2), p. 87-94, maps.

Languages: English

Report No.: ISSN 0273-1223

DNAL Call No.: TD420.A1P7

15

Fisheries in small bodies: An overview of their potential for supplying animal protein to rural populations of Africa. Bernacsek, G.M.

Source: FAO FISH. REP. FAO RAPP. PECHEs, no. 425 (Paper already published in FAO Fish. Rep. No. 360. Summary only.)

RESUME DES TRAVAUX ET EXTRAITS DE LA DOCUMENTATION PREPAREE. COLLOQUE SUR LE DEVELOPPEMENT ET L'AMENAGEMENT DES PECHEs DANS PETITS PLANS D'EAU. SUMMARY OF PROCEEDINGS AND SELECTED PAPERS. SYMPOSIUM ON THE DEVELOPMENT AND MANAGEMENT OF FISHERIES IN SMALL WATER BODIES. ACCRA, GHANA, 7-8 DECEMBER 1987. 1989, pp. 52-53.

Giasson, M.; Gaudet, J.-L., eds.

Languages: English; French

Document Type: CONFERENCE; SUMMARY; BOOK

Report No.: ISBN 92-5-102871-7

Abstract: A large proportion of the African rural population lives near small water bodies such as lakes, rivers swamps, reservoirs and coastal lagoons and may depend heavily on their fish resources for dietary animal protein. In general insufficient government assistance has gone into developing these fisheries and many small systems are underutilized. Small systems are subject to several inherent environmental controls as well as more intensive human usage impacts than most large systems is proposed to generate a rapid and substantial increase in production over a 2 to 4 year period.

Descriptors: inland fisheries; fishery development; fishery management; development projects; aquaculture development

Geographic Descriptors: Africa

Environment: FRESH

16

Possible effect of sedimentary phosphorus on the accumulation of lead in Mytilus edulis.

Bourgoin, B.P.; Risk, M.J.; Aitken, A.E.

(Trent University, Peterborough, Ontario, Canada)

Source: Bulletin of environmental contamination and toxicology. New York, N.Y.: Springer-Verlag. Oct. 1989, v. 43 (4), p. 635-640, maps.

Languages: English

Report No.: ISSN 0007-4861

DNAL Call No.: RA1270.P35A1

17

The effect of the Clean Water Act on shellfish growing waters in the Gulf of Mexico.

Broutman, M.A.

(Univ. California, Los Angeles (USA))

Source: DISS. ABST. INT. PT. B - SCI. & ENG., vol. 49, no. 6, 1988., 116 pp; Ph.D. Order No.: DA8815461.

Languages: English

Summary Languages: English

Document Type: Thesis; Book

Abstract: This report examines the classification of shellfish growing waters in the Gulf of Mexico as an indicator of bacterial water quality. Information presented includes the status of classified waters, sources of pollution affecting waters that are not classified as approved, and trends in classification between 1971 and 1985. Data were collected by site visits to the five Gulf states, interviews with state personnel, and reference to written materials. Data are used to assess the effectiveness of national efforts to improve bacterial water quality in the past fifteen years since passage of the Clean Water Act. The hypothesis to be tested is that these efforts have not succeeded in reducing fecal coliform concentrations to levels required for approved harvest of shellfish, as established by the National shellfish Sanitation Program.

Descriptors: water quality; pollution indicators; data acquisition; brackishwater pollution; legislation; shellfish fisheries

Geographic Descriptors: ASW, Mexico Gulf

Taxonomic Descriptors: bacteria

Environment: Marine

Identifiers: Clean Water Act

18

The quality of shellfish growing waters in the Gulf of Mexico. 1988 Annu. Meet. of the Natl. Shellfisheries Assoc.; New Orleans, LA (USA); 26 Jun 1988.

Broutman, M.A.; Leonard, D.L.

(NOAA Strategic Assess. Branch, Rockville, MD 20852, USA)

Source: J. Shellfish Res., vol. 7, no. 1, p. 197, (1988).

Languages: English

Document Type: CONFERENCE; SUMMARY; JOURNAL ARTICLE

Abstract: The majority of shellfish growing waters in the Gulf of Mexico do not meet the fecal coliform standards for approved harvest; 29% of waters are classified as prohibited, and 27% of waters are managed as conditionally approved and are affected by freshwater inflows from heavy rainfall or high river stages. The most productive oyster reefs are found in these conditionally approved waters. The predominant sources of fecal coliform are sewage treatment and collection systems, septic systems that do not function properly in coastal areas because of poor soils and high groundwater tables, and stormwater runoff from urban areas. Overall, upstream sources affect 57% of harvest-limited areas. Contributions from wildlife are significant in rural estuaries. runoff from pasturelands affects estuaries in Louisiana and Texas. Straight pipes are a problem in coastal Louisiana. Actual effects from industry and boating and shipping activities are minimal compared to other sources.

Descriptors: shellfish culture; water quality; pollution monitoring; pollution effects; microbial contamination; seafood; harvesting; public health; food poisoning; feces; sewage; marine pollution

Geographic Descriptors: ASW, USA, Gulf States

Environment: MARINE

19

A habitat suitability index model for the aquaculture of the Pacific oyster, Crassostrea gigas. 1986 Annu. Meet. of the National Shellfisheries Assoc. Seattle, WA (USA) 22 June 1986.

Brown, J.R.

(Dep. Biol. Sci., Simon Fraser Univ., Burnaby, B.C. V5A 1S6, Canada)

Source: J. Shellfish Res., vol. 7, no. 1, p. 112, (1988). Summary only.

Languages: English

Document Type: Conference; Summary; Journal Article

Abstract: A habitat suitability index (HSI) model was developed in order to evaluate the suitability of coastal areas in British Columbia for the aquaculture of *Crassostrea gigas*. In the model, the effects of abiotic and biotic factors upon oyster growth and mortality are quantified through the use of a relative index. Fundamental to the model is the comparison of existing habitat conditions to the optimum conditions of the habitat variables for the oyster as described in the literature. The performance of the model was evaluated utilizing environmental and oyster production data collected from 10 field sites over a 14 month period. Site-specific HSI values derived from the environmental data were found to be significantly correlated with the increase in shell length of two groups of oysters. The use of the HSI model in the selection of sites for aquaculture operations and in the management of coastal areas will be discussed.

Descriptors: oyster culture; site selection; mathematical models; coastal waters

Geographic Descriptors: INE, Canada, British Columbia

Taxonomic Descriptors: *Crassostrea gigas*

Environment: Marine

20

The effect of salmon farming on the benthos of a Scottish sea loch.

Brown, J.R.; Gowen, R.J.; McLusky, D.S.

(Dep. Biol. Sci., Univ. Stirling, Stirling FK9 4LA, UK)

Source: J. EXP. MAR. BIOL. ECOL., vol. 109, no. 1, pp. 39-51, (1987).

Languages: English

Document Type: JOURNAL ARTICLE

Abstract: The effects of waste from a salmon farm on the benthos of a fjordic sea loch on the western coast of Scotland have been studied. Within 3 m of the floating cages the sediment was highly reducing, and dissolved oxygen content of the water overlying the sediment ranged from 35 to 75% saturation. At greater than or equal to 15 m from the cages the sediment was oxygenated, and the dissolved oxygen content of the water overlying the sediment was 50-85% saturation. Sedimentary redox potential and dissolved oxygen content of bottom water showed a seasonal variation. The benthic fauna showed marked changes in species number, species diversity, faunal abundance, and biomass in the region of the fish farm, with four zones of effect identified.

Descriptors: environmental impact; benthos; aquaculture effluents; pollution effects

Geographic Descriptors: ANE, British Isles, Scotland

Taxonomic Descriptors: salmonidae

Environment: MARINE

21

Effects of the water-soluble fractions of No. 2 fuel oil on the cytokinesis of the quahog clam (Mercenaria mercenaria).

Byrne, C.

Source: Bulletin of environmental contamination and toxicology. New York, N.Y.: Springer-Verlag. Jan. 1989, v. 42 (1), p. 81-86, ill.

Languages: English

Report No.: ISSN 0007-4861

DNAL Call No.: RA1270.P35A1

22

A plan for a water protection programme for the sea off Kuivaniemi with reference to fish farming working group proposal.

Canada. Dept. of Fisheries and Oceans.

Source: (Ottawa?: Dept. of Fisheries and Oceans?). 1986, 86 leaves, ill., maps.

Canadian translation of fisheries and aquatic sciences, no. 5271

Vesihallituksen monistesarja, no. 298

Vesihallituksen monistesarja. English, no. 298

Languages: English

Report No.: ISSN 0358-7169

DNAL Call No.: SH174.K813

23

Small-scale spatial heterogeneity and seasonal variation in the quantity and composition of paralytic shellfish toxins retained in chronically contaminated Mya arenaria; 1988 Annu. Meet. of the Natl. Shellfisheries Assoc.; New Orleans, LA (USA); 26 June 1988.

Cembella, A.D.; Provencher, L.; Demers, S.; Frechette, M.

(Maurice Lamontagne Inst., DFO, Mont-Joli, Que. G5H 3Z4, Canada)

Source: J. Shellfish Res., vol. 7, no. 1, p. 192, (1988). Summary only.

Languages: English

Document Type: CONFERENCE; SUMMARY; JOURNAL ARTICLE

Abstract: The Baie des Capucins along the Gaspé coast of the lower St. Lawrence Estuary was specifically selected as the study site due to the chronically high PSP toxin levels found throughout the year. In spite of posted warnings against the harvesting of shellfish in the Bay, clams are frequently collected by members of the local population and consumed without reported ill effects. The principal objective was to examine potential spatial heterogeneity in toxin levels in *Mya arenaria*. Such differences could conceivably be used to explain variation between single "point-source" samples taken for the toxin monitoring program, and from nearby stations along a horizontal transect. To examine the effects of time-dependent exposure to the causative dinoflagellate *Protogonyaulax tamarensis* through submergence, toxin variations were also compared along a vertical transect extending from the high to low intertidal zone, during a period in late summer when toxin levels in shellfish and dinoflagellate concentrations in the water column are usually maximum. Seasonal differences in PSP toxins were determined on a weekly basis, over the normal ice-free season for the harvesting of wild clam stocks (May to November).

Descriptors: shellfish; food poisoning; biological poisons; red tides

Geographic Descriptors: ANW, St. Lawrence Estuary

Taxonomic Descriptors: *Protogonyaulax tamarensis*; *Mya arenaria*

Environment: MARINE

24

Effects of phenol exposure on the thermal tolerance ability of the central stoneroller minnow

Chagnon, N.; Hlohowskyj, I.

Source: Bulletin of environmental contamination and toxicology. New York, N.Y.: Springer-Verlag. Apr. 1989, v. 42 (4), p. 614-619.

Languages: English

Report No.: ISSN 0007-4861

DNAL Call No.: RA1270.P35A1

25

*Effects of a *Cyperus papyrus* L. swamp on domestic waste water.*

Chale, F.M.M.;

Source: Aquatic botany. Amsterdam: Elsevier Scientific. Nov. 1985, v. 23 (2), p. 185-189.

Languages: English

Report No.: ISSN 0304-3770

DNAL Call No.: QK102.A65

26

*The effects of diesel oil and oil dispersants on growth, photosynthesis, and respiration of *Chlorella salina*.*

Chan, K.Y.; Chiu, S.Y.

Source: Archives of environmental contamination and toxicology. New York, N.Y.: Springer-Verlag. May 1985, v. 14 (3), p. 325-331.

Languages: English

Report No.: ISSN 0090-4341

DNAL Call No.: TD172.A7

27

Impact of pathogens on aquatic plants used in water treatment and resource recovery systems

Charudattan, R.

(University of Florida, Gainesville, FL)

Source: Aquatic plants for water treatment and resource recovery / edited by K.R. Reddy and W.H. Smith. Orlando, Fla.: Magnolia Publishing Inc., 1987. p. 795-803.

Languages: English

Report No.: ISBN: 0941463001

DNAL Call No.: TD475.C65 1986

28

Species profiles: Life histories and environmental requirements of coastal fishes and invertebrates (Pacific Northwest) – common littleneck clam.

Chew, K.K.; Ma, A.P.

Source: BIOL. REP. U.S. FISH WILDL. SERV., 1987., 31 pp.

NTIS Order No.: PB88-127550/GAR.

Languages: English

Document Type: REVIEW; REPORT

Report No.: BIOLOGICAL-82(11 78)

Abstract: Species profiles are literature summaries of the taxonomy, morphology, distribution, life history, and environmental requirements of coastal aquatic species. They are prepared to assist in environmental impact assessments. The common littleneck clam (*Protothaca staminea*) is important both in recreational and commercial fisheries in the Pacific Northwest region. The review describes the life history (spawning, egg and larval stages, postlarvae and juveniles, maturity, and life span), growth characteristics, commercial and sport fisheries, aquaculture, ecological role, and environmental requirements of the species. (Sponsored by National Wetlands Research Center, Slidell, LA., and Army Engineer Waterways Experiment Station, Vicksburg, MS.)

Descriptors: life history; animal morphology; distribution records; environmental effects; habitat; literature reviews; spawning; environmental impact; clam culture; clam fisheries

Geographic Descriptors: INE, USA

Taxonomic Descriptors: *Protothaca staminea*

Environment: MARINE

Identifiers: taxonomy

29

Coastal resources management issues and plan formulation.

Chua, Thia-Eng; Chou, Loke Ming; Jaafar, A.M.B.H.

Source: ICLARM TECH. REP., no. 18. In: THE COASTAL ENVIRONMENTAL PROFILE OF BRUNEI DARUSSALAM: RESOURCE ASSESSMENT AND MANAGEMENT ISSUES. Chua, Thia-Eng; Chou, Loke Ming; Sadorra, M.S.M., eds., 1987, pp. 154-167.

Languages: English

Document Type: Book

Report No.: ISBN 971-1022-37-0

Abstract: Current and potential management issues regarding the coastal zone of Brunei Darussalam are identified, describing their causes, environmental impacts and possible mitigating measures. coastal erosion and sedimentation are examined in particular. A conceptual framework is given for a coastal area management plan. Data gaps and research needs for the following areas are indicated: 1) fish and shrimp resource assessment 2) erosion rates 3) mangrove and fishery linkage 4) socio-economic valuation 5)

artificial reefs and resource enhancement 6) water quality 7) aquaculture and 8) development of institutional framework.

Descriptors: coastal zone; resource management; coastal zone management; environmental impact; aquaculture development

Geographic Descriptors: ISEW, Brunei

Environment: Marine

30

A management strategy to reduce bacterial pollution in shellfish areas: A case study.

Crane, S.R.; Moore, J.A.

(Dep. Agric. Eng., Oregon State Univ., Corvallis, OR 97331, USA)

Source: ENVIRON. MANAGE., vol. 10, no. 1, pp. 41-51, (1986).

Languages: English

Document Type: Journal Article

Abstract: The problem of bacterial pollution in shellfishing areas is not uncommon in the coastal regions of the United States. bacterial contamination from man's activities can effectively reduce natural shellfish resource areas by forcing their closure because of high potential risk of diseases being spread by shellfish harvested in these areas. Tillamook Bay, a relatively small, enclosed drainage basin of nonurban character, presents an excellent study area for observing this problem. The high population density of animals, raised on a relatively small floodplain area, represents one of the major sources of pollution in the bay. This paper summarizes the history of the agencies involved with the problem and presents the current approach to alleviate bacterial pollution in the bay without unduly penalizing other industries in the Tillamook basin. The paper also presents some of the legal aspects of reducing water pollution in shellfish harvesting areas and the jurisdiction of federal agencies in these matters.

Descriptors: pollution control; microbial contamination

Geographic Descriptors: INE, USA, Oregon, Tillamook Bay

Environment: Brackish

31

Using bioenergetics of intertidal oyster populations as a measurement of anthropogenic perturbations to shellfish growing waters; 1988 Annu. Meet. of the Natl. Shellfisheries Assoc.; New Orleans, LA (USA); 26 June 1988.

Crosby, M.P.

(Belle W. Baruch Inst. Mar. Biol. and Coast. Res., Univ. South Carolina, P.O. Box 1630, Georgetown, SC 29442, USA)

Source: J. Shellfish Res., vol. 7, no. 1, pp. 199-200, (1988). **Languages:** English

Document Type: CONFERENCE; SUMMARY; JOURNAL ARTICLE

Abstract: Shellfish growing waters, such as salt marshes and estuaries, adjacent to urban sprawl receive a myriad of wastes and other inputs previously foreign to these sensitive coastal ecosystems. Because oysters are sessile, benthic, and feed by filtering large volumes of water, they serve as "sentinels" of, and are directly affected by, the quality of water passing over them. For this reason, sub-lethal changes in oyster scope for growth can infer that alterations in their surrounding environment have occurred. Methods are described of a study, to examine sub-lethal effects of coastal development on the ecophysiology of intertidal oyster populations in the North Inlet Estuary, SC. Methods discussed will include in situ measurements of oyster scope for growth, O: N ratios, biochemical composition, seston food quantity and quality, recruitment, juvenile survival, and susceptibility to parasitic diseases such as "Dermo" and "MSX". Anticipated accomplishments and benefits of studies of this design are to elucidate the effects of coastal development on shellfish growing waters in terms of 1) nutrient storage; 2) fecundity, recruitment, and juvenile survival; 3) susceptibility to disease; 4) scope for growth; and 5) overall energetics of oysters.

Descriptors: bioenergetics; shellfish culture; oyster culture; brackishwater pollution; pollution effects; pollution monitoring; indicator species; man-induced effects; pollution indicators
Geographic Descriptors: ANW, USA, South Carolina, North Inlet Estuary
Taxonomic Descriptors: *Crassostrea virginica*
Environment: MARINE

32

Experimental studies of the effects of acidity and associated water chemistry on amphibians.

Dale, J.; Freedman, B.; Kerekes, J.

Source: Proceedings of the Nova Scotian Institute of Science. Halifax: The Institute. 1985, v. 35 (pt. 2), p. 35-54.

Languages: English

Report No.: ISSN 0078-2521

DNAL Call No.: 517 H13

33

*Intake of lead from contaminated medium by *Heteropneustes fossilis* (Bloch).*

Das, K.; Nanda, B.; Hota, A.K.

(Post-Grad. Dep. Zool., G.M. Coll., Sambalpur-768004, India)

Source: COMP. PHYSIOL. ECOL., vol. 10, no. 3, pp. 145-149, (1985).

Languages: English

Document Type: Journal Article

Abstract: *Heteropneustes fossilis* (Bloch) a delicious edible fish of this locality, carnivorous, lives in a lead contaminated muddy habitat. lead retention in the bone of *H. fossilis* is higher than the muscle. The increase in the dose of contamination of the medium has no significant effect on the retention capacity of muscles whereas a two fold increase of medium contamination is manifested as a four fold increase in the retention capacity of bones. The entry of lead into *H. fossilis* is irreversible. The tissues can concentrate more lead when it is available through the intestinal tract.

Descriptors: lead; bones; muscles; bioaccumulation

Taxonomic Descriptors: *Heteropneustes fossilis*

Environment: Fresh

34

*Effects of tributyltin compounds from antifoulants on Pacific oysters (*Crassostrea gigas*) in Scottish sea lochs.*

Davies, I.M.; Drinkwater, J.; McKie, J.C.

(DAFS Mar. Lab., Victoria Rd., P.O.B. 101, Aberdeen AB9 8DB, UK)

Source: AQUACULTURE., vol. 74, no. 3-4, pp. 319-330, (1988).

Languages: English

Summary Languages: English

Document Type: Journal Article

Abstract: Before 1987, tributyltin-based antifoulants were used in Scottish sea lochs on both the hulls of vessels and on cage nets at marine salmon farms. In two sea lochs, the leachates from these anti-foulants caused accumulation of tin compounds in soft tissue, and had deleterious effects on the shell structure, growth and condition of Pacific oysters (*Crassostrea gigas*). The extent and intensity of the effects appeared to be dependent upon source size and distribution, and upon hydrographic factors. The use of triorganotin compounds in antifoulants for mariculture applications, and on vessels 25 m, has now been prohibited in

the U.K.

Descriptors: antifouling substances; tin compounds; pollution effects; oyster culture; cage culture; fish culture; shells; growth; condition factor; pollution control

Geographic Descriptors: ANE, British Isles, Scotland

Taxonomic Descriptors: salmonidae; *Crassostrea gigas*

Environment: Marine

35

Accumulation of tin and tributyltin from anti-fouling paint by cultivated scallops (Pecten maximus) and Pacific oysters (Crassostrea gigas).

Davies, I.M.; McKie, J.C.; Paul, J.D.

(Mar. Lab., Victoria Rd., Aberdeen AB9 8DB, UK)

Source: AQUACULTURE, vol. 55, no. 2, pp. 103-114, (1986).

Languages: English

Summary Languages: English

Document Type: Journal Article

Abstract: The accumulation of total tin and tributyltin by oysters (*Crassostrea gigas*) and scallops (*Pecten maximus*) from anti-fouling paint, and the subsequent depuration of these substances, have been observed over a period of 41 weeks. oysters accumulated up to 1.41 mg/kg tin (0.87 mg/kg TBT-tin), and subsequently lost 90% of this during depuration. Juvenile scallops accumulated 2.5 mg/kg total tin (1.86 mg/kg TBT), but lost only 20-40% of this. In adult scallops, individual organs were analysed, and a progressive transfer of TBT to the adductor muscle was found. At the end of the experiment the adductor muscle contained 0.53 mg/kg. There is evidence of a storage/detoxification mechanism for TBT operating in both scallops and oysters, but which is more effective in scallops, and involves the adductor muscle.

Descriptors: bioaccumulation; tin compounds; antifouling substances; heavy metals; scallop culture; oyster culture; self purification

Taxonomic Descriptors: *Pecten maximus*; *Crassostrea gigas*

Environment: Marine

36

An analysis of ten state aquaculture leasing systems: Issues and strategies.

DeVoe, M.R.; Mount, A.S.

(South Carolina Sea Grant Consort., 287 Meeting St., Charleston, SC 29401, USA)

Source: J. Shellfish Res., vol. 8, no. 1, pp. 233-239, (1989).

Languages: English

Document Type: JOURNAL ARTICLE

Abstract: The institutional framework established for aquaculture in the USA was examined, with particular attention to leasing of public resources in coastal states. Related laws and regulations in 10 states were analyzed to determine the types of lease programs available, minimum and maximum size and duration, degree of exclusivity, and fee and bond structures. Initial phone interviews were conducted with agency personnel in 23 coastal states; officials of 10 selected states were questioned further to qualitatively determine the effectiveness in implementation of leasing programs. Of the 23 coastal states contacted, 19 have so-called "traditional" shellfish lease programs, while only 12 have adopted "contemporary" aquaculture leasing mechanisms. Provisions of leasing programs vary greatly among states, but as a whole, few programs actually meet the needs of the culture industry. Many issues, including concerns over public access, use conflicts and lack of suitable sites, must be resolved before the extensive results of United States aquaculture research and development programs can be used by the private sector in domestic waters.

Descriptors: aquaculture regulations; leases; coastal states; shellfish culture

Geographic Descriptors: USA Coasts; ANW, USA, South Carolina

Environment: MARINE

37

Aluminum and acid rain: Mitigating effects of NaCl on aluminium toxicity to brown trout (Salmo trutta fario) in acid water

Dietrich, D.; Schlatter, C.; Blau, N.; Fischer, M.

Source: Toxicological and environmental chemistry. London: Gordon and Breach Science Publishers. 1989, v. 19 (1/2), p. 17-23.

Languages: English

Report No.: ISSN 0277-2248

DNAL Call No.: QD241.T6

38

Developments in bottom cultivation of mussels and oysters in the Netherlands: Studies on the effects of storm surge barrier construction; 1989 Annu. Meet. of the National Shellfisheries Association Los Angeles, CA (USA) 12 Feb. 1989.

Dijkama, R.

(Netherlands Inst. Fish. Invest., P.O. 77, 4400 AB Yerseke, Netherlands)

Source: J. Shellfish Res., vol. 7, no. 3, p. 567, (1988). Summary only.

Languages: English

Document Type: CONFERENCE; SUMMARY; JOURNAL ARTICLE

Abstract: A vast project of dam construction, dike heightening and other coastal engineering works in the low-lying southwestern part of the Netherlands has had positive as well as negative effects on molluscan shellfish cultivation in the Netherlands. A negative effect of the project was that a number of fishing harbours and sites for cultivation of the blue mussel (*Mytilus edulis*) and the European flat oyster (*Ostrea edulis*) had to be given up. A research program, undertaken to assess the impact of this barrier on mussel and oyster cultivation and on the local ecosystem, indicated as positive effects locally lower current velocities, making bottom culture possible on locations where this had been impossible before.

Descriptors: mollusk culture; aquaculture systems; aquaculture development; bottom culture; dams; environmental impact

Geographic Descriptors: ANE, Netherlands

Environment: MARINE

39

Establishment of parameters critical to sturgeon management in the Pacific Northwest. Advances in Aquaculture and Fisheries Research: A California Sea Grant Symposium Davis, CA (USA) 18-20 May 1983.

Doroshov, S.

(Aquacult. Program, Univ. California, Davis, CA 95616, USA)

Anderson, K.E., ed.

Source: REP. CALIF. SEA GRANT COLL. PROGRAM, 1985, p. 16.

ADVANCES IN AQUACULTURE AND FISHERIES RESEARCH. REPORT OF A CALIFORNIA SEA GRANT SYMPOSIUM, MAY 18 to 20, 1983, HELD AT THE UNIVERSITY OF CALIFORNIA, DAVIS.

Languages: English Summary only.

Document Type: Conference; Summary; Report

Report No.: T-CSGCP-010

Abstract: Two of the five species of sturgeon in waters of the North American continent are indigenous to the Pacific Northwest: the white, (*Acipenser transmontanus*), and the green sturgeon (*Acipenser medirostris*). Both were historically important resources that received extensive pressure from commercial fishing and became endangered. Stringent regulations were imposed. The positive effect of regulations may be nullified by rekindled legal and illegal interest in the resource and the adulteration of our coastal rivers which are vital spawning grounds. A technique for artificial propagation of white sturgeon has been developed. Population structure, environmental requirements, and basic physiological functions for both species remain unknown. This knowledge is necessary for conservation resource improvement through environmental protection and management, and hatchery enhancement.

Descriptors: fishery management; fishery regulations; fishery industry; fish culture; nature conservation

Geographic Descriptors: INE, USA

Taxonomic Descriptors: *Acipenser medirostris*; *Acipenser transmontanus*

Environment: Marine

40

Toxic effects of zinc, cadmium and their mixtures on the growth of two unicellular green algae.

Dragos, N.; Bercea, V.; Nicoara, A.; Chiorean, A.

Source: Revue roumaine de biologie: Serie de biologie vegetale. Bucurest : Editura Academiei Republicii Socialiste Romania. July/Dec. 1988, v. 33 (2), p. 103-110.

Languages: English

Report No.: ISSN 0035-3914

DNAL Call No.: QK1.R4

41

Region 3: Afrique Occidentale: Lagunes de Cote d'Ivoire

(Region 3: West Africa: Lagoons of Ivory Coast.).

Dufour, P.

(Inst. Fr. Rech. Sci. Dev. Coop., ORSTOM, Stn. Hydrobiol. Lacustre, Ave. de Corzent, 74203 Thonon les Bains, France)

Burgis, M.J.; Symoens, J.J., eds.

Source: TRAV. DOC. INST. FR. RECH. SCI. DEV. COOP., no. 211, 1987, pp. 155-176.

ZONES HUMIDES ET LACS PEU PROFONDS D'AFRIQUE. (AFRICAN WETLANDS AND SHALLOW WATER BODIES.).

Languages: French

Document Type: Dictionary; Book

Report No.: ISBN 2-7099-0881-6

Abstract: The coastal lagoons system of Ivory Coast includes three lagoons: Grand Lahou, Ebie, Aby. That chapter deals with climate, rainfall, geology, geography, morphometry, hydrography, hydrology, water properties and communities composition (macrophytes, phytoplankton, phytobenthos, zooplankton, zoobenthos) and fishes. The human impacts on water pollution, fisheries and water management are discussed.

Descriptors: coastal lagoons; climatic data; morphometry; physicochemical properties; anthropogenic factors; water pollution; urbanization; aquaculture; water management

Geographic Descriptors: ASE, Ivory Coast

Environment: Brackish

42

Donnees sur l'influence de certains facteurs de milieu sur l'etat de sante de la truite arc-en-ciel (Salmo gairdneri irideus) cultivee en eau de mer.

(Data on the effects of certain environmental conditions on the health of rainbow trout (*Salmo gairdneri irideus*) cultured in seawater.).

Dumitrescu, E.; Smocov, V.; Voicu, I.; Ghitescu, E.

(Inst. Roumain Rech. Mar., Constanta, Romania)

Source: CERCET. MAR. RECH. MAR., no. 18, pp. 213-219, (1985).

Languages: French; English

Document Type: JOURNAL ARTICLE

Abstract: Considering the special importance of the health condition of rainbow trout (*Salmo gairdneri irideus*) cultivated in marine waters, the influence of several physical and chemical factors on the fish health for the period 1982-1985 were determined. The data revealed a better health condition in spring, when the values of the physical and chemical factors were optimum for rainbow trout growth and the fish had an intense feeding. In summer, when the water temperature exceeded 22 degree C and the oxygen content was below 4 ml/l, the health condition was affected and a decrease of the red cells, hemoglobin and serous proteins was noted. In those conditions there were some diseases induced by the pathogenic germs *Aeromonas hydrophila*, *Vibrio parahaemolyticus* and *V. anguillarum*.

Descriptors: fish culture; fish diseases; environmental conditions; seasonal variations; pathogenic bacteria

Taxonomic Descriptors: *Salmo gairdneri irideus*

Environment: MARINE

43

Fish farms polluting the Archipelagic Sea.

Eklund, J.

Source: CAN. TRANSL. FISH. AQUAT. SCI., no. 5269, 1986, 9 pp.

Languages: English

Document Type: Book

Report No.: ISSN 0704-3716

Abstract: Fish farming competes with traditional fishing in Finland. Its waste products are suspected of polluting the Archipelagic Sea so that the Baltic herring, *Clupea harengus*, can no longer swim through the channels to its spawning grounds. The author discusses this pollution and some ways in which the problem could be helped. (Available from: Canada Inst. Sci. Tech. Inf., Natl. Res. Council, Ottawa, Ont. K1A 0S2.)

Descriptors: fish culture; pollution effects; translations

Geographic Descriptors: ANE, Finland, Archipelagic Sea

Taxonomic Descriptors: *Clupea harengus*

Environment: Marine

Identifiers: spawning populations

44

Rainbow trout farming polluting the Archipelagic Sea.

Eklund, J.

Source: CAN. TRANSL. FISH. AQUAT. SCI., no. 5251, 1986., 8 pp.

Languages: English

Document Type: Book

Report No.: ISSN 0704-3716

Abstract: Fish farming in Finland coincided with a gap in fishery industry policies and legislation which included environmental supervision. The pollution of the Archipelagic Sea by rainbow trout, *Salmo*

gairdneri farming, as well as the effects of farming on a traditional fishery like the Baltic herring, *Clupea harengus*, are discussed by the author. (Available from: Canada Inst. Sci. Tech. Inf., Natl. Res. Council, Ottawa, Ont. K1A 0S2.)

Descriptors: fish culture; aquaculture effluents; pollution effects; translations

Geographic Descriptors: ANE, Finland, Archipelagic Sea

Taxonomic Descriptors: *Clupea harengus*; *Salmo gairdneri*

Environment: Marine

Identifiers: commercial fishing

45

The environmental impact of aquaculture and the effects of pollution on coastal aquaculture development in Southeast Asia.

Eng, Chua Thia; Paw, J.N.; Guarin, F.Y.

(Int. Cent. Living Aquat. Resour. Manage., M.C.P.O. Box 1501, Makati, Metro Manila, Philippines)

Source: MAR. POLLUT. BULL., vol. 20, no. 7, pp. 335-343, (1989). Special issue: pollution in the Far East.

Languages: English

Document Type: JOURNAL ARTICLE

Abstract: Accelerated development of coastal aquaculture in the last three decades has created negative environmental impacts. Similarly, the increasing deterioration of coastal water quality resulting from the discharge of domestic, agricultural and industrial wastes into coastal waters has affected aquaculture production and profitability. Furthermore, the increased frequency of red tides in the region has posed serious threats to coastal aquaculture, especially to mollusk cultivation. The introduction of management measures to mitigate deteriorating coastal water quality and the adverse environmental impacts of aquaculture development has now become a matter of urgency to the region.

Descriptors: marine aquaculture; aquaculture development; aquaculture effluents; red tides; mollusk culture

Geographic Descriptors: Southeast Asia

Environment: MARINE

Identifiers: pollution effects; environmental impact; coastal waters

46

Species profiles: Life histories and environmental requirements of coastal fishes and invertebrates (South Atlantic)—hard clam.

Eversole, A.G.

Source: BIOL. REP. U.S. FISH WILDL. SERV., 1987, 40 pp.

(NTIS Order No.: PB88-127568/GAR.)

Languages: English

Document Type: REVIEW; REPORT

Report No.: BIOLOGICAL-82(11 75)

Abstract: Species profiles are literature summaries of the taxonomy, morphology, range, life history and environmental requirements of coastal species. They are designed to assist in environmental impact assessment. The hard clam, *Mercenaria mercenaria*, supports an important commercial fishery in the South Atlantic, averaging about 1 million kg of meats annually from 1979 to 1983. It also is an important constituent of estuarine systems throughout the region. Spawning occurs in the spring and the fall at 16 to 30 degree C. Planktonic eggs and larvae are carried by water currents, and larvae set sometime after 6 days of age. Mortality is highest in egg and larval stages, the most sensitive part of the life cycle. Spat display gregarious setting behavior and appear to select sand over finer substrates. (Sponsored by National Wetlands Research Center, Slidell, LA., and Army Engineer Waterways Experiment Station, Vicksburg, MS.)

Descriptors: life history; taxonomy; animal morphology; distribution records; environmental effects; habitat;

literature reviews; environmental impact; commercial species; clam fisheries; settling behavior
Geographic Descriptors: ASW, USA
Taxonomic Descriptors: *Mercenaria mercenaria*
Environment: MARINE

47

Acid rain: Implications for the farming of salmonids.

Exley, C.; Phillips, M.J.

(Inst. Aquacult., Univ. Stirling, Stirling FK9 4LA, UK)

Muir, J.F.; Roberts, R.J., eds.

Source: RECENT ADVANCES IN AQUACULTURE. VOL. 3, 1988, pp. 225-341.

Languages: English

Document Type: Review; Bibliography; Book

Report No.: ISBN 0-7099-3592-7

Abstract: This review deals with the process of acidification, its varying causes and consequences, and its range of effects on the salmonids.

Descriptors: acid rain; biological stress; pollution effects; toxicity; environmental impact; fish culture; literature reviews

Taxonomic Descriptors: salmonidae; salmo salar

48

Species profiles: Life histories and environmental requirements of coastal fishes and invertebrates

(North Atlantic)—American eel.

Facey, D.E.; Van Den Avyle, M.J.

Source: BIOL. REP. U.S. FISH WILDL. SERV., 1987, 37 pp.

(NTIS Order No.: PB88-126172/GAR.)

Languages: English

Document Type: REPORT

Report No.: BIOLOGICAL-82(11 74)

Abstract: Species profiles are literature summaries of taxonomy, life history, and environmental requirements of coastal fishes and aquatic invertebrates. They are prepared to assist with impact assessments. The American eel is an ecologically and economically important catadromous species that occupies freshwater streams, rivers, brackish estuaries, and the open ocean during various phases of its life cycle. Adult eels *Anguilla rostrata* apparently spawn in the Sargasso Sea, and ocean currents transport the developing larvae northward until the young metamorphose into juveniles capable of swimming shoreward and moving upstream into coastal areas, estuaries, and rivers. Alteration of patterns of freshwater inflows to estuaries and bays could affect upstream migrations. (Prepared in cooperation with Georgia Univ., Athens. Dep. of Zoology. Sponsored by Fish and Wildlife Service, Washington, DC. Div. of Biological Services, and Army Engineer Waterways Experiment Station, Vicksburg, MS).

Descriptors: life history; animal morphology; distribution records; environmental effects; habitat; literature reviews; catadromous migrations

Geographic Descriptors: AW, West Atlantic; ASW, Sargasso Sea

Taxonomic Descriptors: *Anguilla rostrata*

Environment: MARINE; BRACKISH; FRESH

Identifiers: taxonomy

49

A computerized coding system for organs, tissues, lesions, and parasites of bivalve mollusks and its application in pollution monitoring with Mytilus edulis. 4. International Symposium on Response of Marine Organisms to pollutants Woods Hole, MA (USA) 22 Apr 1987.

Farley, C.A.

(NOAA/NMFS, Northeast Fish. Cent., Oxford Lab., Oxford, MD 21654, USA)

Stegeman, J.J.; Moore, M.N., eds.

Source: MAR. ENVIRON. RES., vol. 24, no. 1-4, 1988, pp. 243-249.

Response of marine organisms to pollutants.

Languages: English

Summary Languages: English

Document Type: Book

Abstract: A computerized coding system for evaluating effects of pathologic and parasitologic disease on bivalve mollusks has been developed. Date, geographic location, and organ system(s) involved can be compared with prevalence and intensity of gross and microscopic lesions as well as parasitic infections on an individual, sample, or specific parameter basis. The system is open-ended and can be easily modified or expanded as new parameters are recognized. Samples of 50 *Mytilus edulis* have been collected from 11 sites along the east coast of the United States from Virginia north to the Canadian border, examined, and analyzed using this system. Over 2000 lesions and/or parasites have been diagnosed from more than 700 specimens collected from these sites. The majority of lesions were inflammatory (15 types with almost 1000 examples). Degenerative changes were seen 600 times, repair and proliferative responses 60 times, and parasitic infections 300 times.

Descriptors: pollution effects; parasitic diseases; pathology; data collections; pollution effects

Geographic Descriptors: ANW, USA

Taxonomic Descriptors: *Mytilus edulis*; Bivalvia

Environment: Marine

50

Effect of dissolved organic matter on extraction efficiencies. Organochlorine compounds from Niagara River water.

Fish, C.L.; Driscoll, M.S.; Hassett, J.P.

Source: Advances in chemistry series. Washington, D.C.: American Chemical Society. 1989 (219), p. 223-229.

Languages: English

Report No.: ISSN 0065-2393

DNAL Call No.: 381 AD93

51

Sediment-associated contaminants—an overview of scientific bases for developing remedial options.

Forstner, U.

R. Thomas, R. Evans, A. Hamilton, M. Munawar, [et al.], eds.

Source: Ecological effects of in-situ sediment contaminants: Proceedings of an international workshop, held in Aberystwyth, Wales, 1984, p. 221-246. Developments in hydrobiology 39. Dordrecht: Dr. W. Junk, 1987.

Languages: English

Report No.: ISBN 906193639X

DNAL Call No.: TD223.3.E26

52

Effect of sediment contact and uptake mechanisms on accumulation of three chlorinated hydrocarbons in the midge, Chironomus riparius.

Fry, D.M.; Fisher, S.W.

(Ohio State University, Columbus, OH)

Source: Bulletin of environmental contamination and toxicology. New York, N.Y.: Springer-Verlag. May 1990, v. 44 (5), p. 790-797.

Languages: English

Report No.: ISSN 0007-4861

DNAL Call No.: RA1270.P35A1

53

Untersuchungen zur Freiwassereignung einsoemmriger Planktonfresser nach erfolgter Aufzucht in erwarmten Brackwasser

The suitability of yearling plankton feeders for open water conditions after rearing in heated brackish water. Gallandt, G.

(Inst. Hochseefisch. und Fischverarb., Bereich Aquakult., Rostock, GDR)

Source: FISCHEREI-FORSCHUNG., vol. 24, no. 2, 1986, pp. 46-49.

FISCHEREILICHE UNTERSUCHUNGEN DER DDR UND DER USSR IN DER OSTSEE.

(FISHERIES RESEARCH BY THE GDR AND THE USSR IN THE BALTIC SEA.).

Languages: German

Summary Languages: German; English; Russian

Document Type: Book

Abstract: The problems of salinity tolerance and temperature are very important when introducing plankton feeders into brackish coastal waters. The influence of salinity on the survival of the fishes is particularly critical at low temperatures (wintering in brackish waters at natural temperatures). The influence of individual weight before wintering and the time wintering begins was investigated in a number of experiments carried out on model stocks of yearling and older plankton feeders. Results at the end of the ca. six month long wintering period indicated that with regard to individual weight when wintering begins salinity tolerance is lower in younger than in older fish. Salinities as low as 3.2 ppt caused total losses in stocks of fish weighing 2 g. Wintering stocks with and individual weight of 20 g were seriously harmed by salinities of greater than or equal to 7 ppt. Wintering in warmed brackish water (10-15 degree C) did not produce any improvement. In addition to the salt and current stress the artificial temperature proved to be physiologically harmful. Reasonable survival rates were achieved exclusively in fresh water wintering experiments which were carried out for comparison. The early introduction of fish to cold water conditions is made necessary by the temporal barrier which affects the ability of the fish to adapt to cold water conditions (endogenic seasonal rhythms).

Descriptors: fish culture; salinity tolerance; plankton feeders; temperature effects; winter; brackishwater environment; coastal waters; survival

Environment: Brackish

54

Treatability studies and toxicity reduction in pulp and paper mill effluents.

Galvao F., J.B.; Grieco, V.M.; Araujo, R.P.A.; Ortolano, M.R.; [et al.]

Source: Water science and technology: A journal of the International Association on Water pollution Research. Oxford: Pergamon Press. 1988, v. 20 (1), p. 149-160, ill.

Languages: English

Report No.: ISSN 0273-1223

55

Pollutant studies in marine animals.

Giam, C. S.; Ray, Lee E.

C.S. Giam, Lee E. Ray, eds.

Source: CRC Press. Boca Raton, Fla. 1987, 187 p., ill.

Languages: English

Report No.: LCCN 86031690; ISBN 0849354072

DNAL Call No.: QH545.W3P62

56

The ecological impact of salmonid farming in coastal waters: A review.

Gowen, R.J.; Bradbury, N.B.

(Dep. Biol. Sci., Stirling Univ., Stirling, UK)

Barnes, M., ed.

Source: OCEANOGR. MAR. BIOL. ANNU. REV., vol. 25, 1987, pp. 563-575

OCEANOGRAPHY AND MARINE BIOLOGY: AN ANNUAL REVIEW. PUBLISHER: ABERDEEN UNIVERSITY PRESS, ABERDEEN (UK)

Languages: English

Document Type: Review; Book

Report No.: ISBN 0-08-035066-8

Descriptors: environmental impact; fish culture; intensive culture; agriculture effluents; coastal waters; literature reviews

Taxonomic Descriptors: salmonidae

Environment: Marine

57

The relative effects of seston flux and sediments on individual growth rates of Mercenaria mercenaria: Results of a factorial field experiment; 1987 Annu. Meet. of the Natl. Shellfisheries Assoc.; Halifax, N.S. (Canada), 9 Aug. 1987.

Grizzle, R.E.

(CCES and Fish. and Aquacult. Technol. Ext. Cent., Rutgers Univ., New Brunswick, NJ 08903, USA)

Source: J. Shellfish Res., vol. 7, no. 1, pp. 160-161, (1988). Languages: English Summary only

Document Type: CONFERENCE; SUMMARY; JOURNAL ARTICLE

Abstract: Preliminary descriptive/correlative field studies on wild *Mercenaria mercenaria* in a coastal lagoon in southern New Jersey suggested that individual growth rates are affected by "food provision rate" and deposited sediments. A field experiment using hatchery-reared clams was run from May-Sept. 1986 to determine relative effects of seston flux and sediments. An ANOVA, with change in shell length as the dependent variable, showed significant differences between sites and sediment type. Combining all data by site and sediment type showed a 13% difference in growth rates between the slowest and fastest sites, and a 6% difference between sediment types, with slowest growth in mud and fastest in sand. tidal current velocities and 4 seston parameters (chlorophyll a, particulate inorganic and organic matter, and energy content) were measured 20 times in near-bottom waters at each site. Neither seston concentrations nor current velocities alone were correlated with growth rates. Hence, the significant "site" differences are attributed to differences in seston flux.

Descriptors: clam culture; growth; environmental conditions; seston; food availability
Geographic Descriptors: ANW, USA, New Jersey
Taxonomic Descriptors: *Mercenaria mercenaria*
Environment: MARINE

58

Modifications et transformations des ecosystèmes sédimentaires par des élevages piscicoles en Lagune Berie (Cote D'Ivoire).

Modification and transformation of sedimentary ecosystems by fish culture in the Ebrie Lagoon (Ivory Coast).
Guiral, D.

(Cent. Rech. Oceanogr., B.P. V 18 Abidjan, Ivory Coast)

Source: AQUACULTURE, vol. 52, no. 4, pp. 287-302, (1986).

Languages: French

Summary Languages: English; French

Document Type: Journal Article

Abstract: Results are presented of a study on 3 types of sediments sampled within the new aquaculture structures tested in the Ebrie Lagoon: enclosure and enclosure cages, set in shallow brackish water 0 - 5 ppt salinity) with strong riverine flow influence. Physical (grain size), geochemical (C and N in organic matter) and biological (phytobenthos, malacofauna and bacteria) parameters clearly showed transformations of sedimentary biota, corresponding essentially to an elimination of fine and medium sedimentary fractions related to bioturbation activities of fishes. No eutrophication was detected, in contrast to results obtained in the sediment under floating cages in a continental environment. The future of new culture techniques is discussed for the aquaculture station in Layo (Ivory Coast). Recommendations have to be respected when using enclosure cages which seem to represent a promising alternative for the intensive culture of *Tilapia guineensis* in tropical lagoons.

Descriptors: fish culture; habitat improvement; sediment; cage culture; brackishwater aquaculture; culture effects; bioturbation; phytobenthos; benthos; dissolved oxygen; predation; intensive culture

Geographic Descriptors: ASE, Ivory Coast, Ebrie Lagoon

Taxonomic Descriptors: Mollusca; bacteria; *Tilapia guineensis*

Environment: Brackish

59

Fish diseases, an index of water pollution: A review. FAO/UNEP Meet. on the Effects of pollution on Marine Ecosystems Blanes (Spain) 7 Oct. 1985.

Halim, Y.; Faisal, M.; Ahmed, I.

(UNARC and Fac. Sci., Alexandria Univ., Alexandria, Egypt)

Source: FAO FISH. REP. FAO RAPP. PECHEs., no. 352, supplement, 1987, pp. 97-104.

Communications presentées à la réunion FAO PNUE sur les effets de la pollution sur les écosystèmes marins Blanes Espagne 7-11 Octobre 1985. (Papers presented at the FAO/UNEP meeting on the effects of pollution on marine ecosystems, Blanes, Spain, 7-11 October 1985). (FAO NO.: FAO FIRI/R352(suppl))

Languages: English

Document Type: Conference; Book

Report No.: ISBN 92-5-002297-2.

Abstract: A review is made of major concepts and mechanisms involved in fish diseases as an indicator of pollution of the aquatic environment, considering in particular the Mediterranean. Morphological, biochemical and physiological changes within the body of fish under stress are described, and the disease process discussed with respect to pollution-induced stress.

Descriptors: marine pollution; pollution monitoring; fish diseases; animal morphology; animal physiology;

biochemistry; pollution effects; Pisces
Geographic Descriptors: MED
Environment: Marine

60

Concurrent mobile on-site and in situ striped bass contaminant and water quality studies in the Choptank River and upper Chesapeake Bay.

Hall, L.W., Jr.; Bushong, S.J.; Ziegenfuss, M.C.; Hall, W.S.; Herman, R.L.

(Appl. Phys. Lab., Aquat. Ecol. Sect., Johns Hopkins Univ., Shady Side, MD 20764, USA)

Source: ENVIRON. TOXICOL. CHEM., vol. 7, no. 10, pp. 815-830, (1988).

Languages: English

Summary Languages: English

Document Type: Journal Article

Abstract: In situ and mobile on-site striped bass (*Morone saxatilis*) prolarval and yearling survival studies were conducted in the Choptank River and in the Chesapeake and Delaware (C&D) Canal area of the Upper Chesapeake Bay. Prolarval survival data from both the in situ and mobile on-site studies were similar for each spawning area. Prolarval survival ranged from 30 to 45% after 96 h of exposure to Choptank River water in four separate experiments (two in situ, two on-site) control survival was 74%. Based on a comparison of laboratory toxicity data and reported field concentrations in the Choptank River for various water quality and contaminant conditions, the following combination of conditions was potentially stressful to striped bass prolarvae: low hardness (36 to 48 mg/L CaCO₃), monomeric aluminum (0.150 mg/L), cadmium (0.003 mg/L) and copper (0.040 mg/L).

Descriptors: survival; water quality; juveniles; pollution effects; fish larvae; toxicity tests

Geographic Descriptors: ANW, Chesapeake Bay; USA, Maryland, Choptank R.

Taxonomic Descriptors: *Morone saxatilis*

Environment: Brackish; Fresh

61

Long-term effects of bleached kraft mill effluents on red and white blood cell status, ion balance, and vertebral structure in fish.

Hardig, J.; Andersson, T.; Bengtsson, B.E.; Forlin, L.; Larsson, A.

Source: Ecotoxicology and environmental safety. Duluth, Minn.: Academic Press. Feb. 1988, v. 15 (1), p. 96-106.

Languages: English

Report No.: ISSN 0147-6513

DNAL Call No.: QH545.A1E29

62

Effects of contaminants on naiad mollusks (Unionidae): A review.

Havlik, Marian E.; Marking, Leif L.

(U.S. Fish and Wildlife Service)

Marian E. Havlik, Leif L. Marking, eds.

Source: Resource publication / United States Department of the Interior, Fish and Wildlife Service.

Washington, D.C.: U.S. Dept. of the Interior, Fish and Wildlife Service. 1987. 164, ii, 20 p.

Languages: English

Report No.: LCCN: 86607941

63

Water pollution and fish physiology.

Heath, Alan G., ed.

Source: CRC Press: Boca Raton, Fla., c1987, 245 p., ill.

Languages: English

Report No.: LCCN 86024348; ISBN 0849346495

DNAL Call No.: SH174.H4

64

Biological feasibility of growing the northern bay scallop, Argopecten irradians irradians (Lamarck, 1819), in coastal waters of Georgia.

Heffernan, P.B.; Walker, R.L.; Gillespie, D.M.

(Mar. Extension Serv., Univ. Georgia, P.O. Box 13687, Savannah, GA 31416-0687, USA)

Source: J. Shellfish Res., vol. 7, no. 1, pp. 83-88, (1988).

Languages: English

Document Type: JOURNAL ARTICLE

Abstract: Two studies were carried out to evaluate the potential of pearl net cultivation of non-native (northern) bay scallops, *Argopecten irradians irradians* in the coastal waters of Georgia. In October 1984, scallops were placed in pearl nets suspended from a floating raft in House Creek, Little Tybee Island, Georgia, at a density of 70/net. By May 1985, scallops averaged 43.2 mm plus or minus 2.3 S.E. in shell length with 27% larger than 50 mm (commercial size) and 47% survival. In a second study density dependent and site specific effects on scallop growth were evaluated between an "exposed" site (Priest Landing) and a "sheltered" site (House Creek). Growth at the "sheltered" site was significantly greater at similar stocking densities (100/net 200/net) and also at higher stocking densities than at the "exposed" site.

Descriptors: scallop culture; aquaculture systems; potential resources; experimental culture

Geographic Descriptors: ASW, USA, Georgia

Taxonomic Descriptors: *Argopecten irradians irradians*

Environment: MARINE

65

Effect of naphthalene and aqueous crude-oil extracts on the green flagellate Chlamydomonas angulosa. VII. nitrate and methylamine uptake and retention.

Hellebust, J.A.; Soto, C.; Hutchinson, T.C.

Source: Canadian journal of botany = Journal canadien de botanique. Ottawa, Ont.: National Research Council of Canada. Apr. 1985, v. 63 (4), p. 834-840.

Languages: English

Report No.: ISSN 0008-4026

DNAL Call No.: 470 C16C

66

Comparative effects of two antifouling paints on the oyster Crassostrea gigas.

His, E.; Robert, R.

(IFREMER, Quai du Commandant Silhouette, F-33120 Arcachon, France)

Source: MAR. BIOL., vol. 95, no. 1, pp. 83-86, (1987).

Languages: English

Document Type: Journal Article

Abstract: The effects of 2 antifouling paints, one containing organotin compounds, the other copper oxide, were studied from Sep 1983 to Oct 1984 on *Crassostrea gigas* grown under natural field conditions in the Bay of Arcachon, France. The organotin paint reduced growth rate expressed as weight, length and width, but did not affect shell height it drastically decreased the dry condition factor and shell density, but did not affect the viability of embryos and larvae from exposed oysters. However, some decrease in larval growth rate was observed. The copper paint had no effect on oyster growth, but lowered the condition factor compared to controls. Neither viability of embryos or larvae nor larval growth were affected by this paint.

Descriptors: antifouling substances; mortality; growth; condition factor; molluscan larvae; pollution effects; toxicity; tin compounds; copper compounds

Geographic Descriptors: ANE, France, Arcachon Lagoon

Taxonomic Descriptors: *Crassostrea gigas*

Environment: Marine

67

Toxic organic chemical in the Chesapeake Bay ecosystem.

Huggett, R.J.

Source: The Chesapeake: Prologue to the future. Proceedings from the Chesapeake Bay Symposium. Baltimore, Md.: National Aquarium Baltimore. [1985]. p. 56-57.

Languages: English

DNAL Call No.: GC97.N3 1985

68

Effect of naphthalene and aqueous crude-oil extracts on the green flagellate Chlamydomonas angulosa. VI. phosphate uptake and retention.

Hutchinson, T.C.; Soto, C.; Hellebust, J.A.

Source: Canadian journal of botany = Journal canadien de botanique. Ottawa, Ont.: National Research Council of Canada. Apr. 1985, v. 63 (4), p. 829-833.

Languages: English

Report No.: ISSN 0008-4026

DNAL Call No.: 470 C16C

69

Influence of water quality on larvae of the red abalone Haliotis rufescens; 42. Annu. Meet. Pacific Coast Oyster Growers Assoc. and Natl. Shellfish. Assoc. Pacific Coast Sect.; Olympia, WA (USA); 22 Sept. 1988.

Jaeckle, W.B.; Manahan, D.T.

(Dep. Biol. Sci., Univ. Southern California, Los Angeles, CA 90089-0371, USA)

Source: J. Shellfish Res., vol. 8, no. 1, p. 322, (1989).

Languages: English

Document Type: CONFERENCE; SUMMARY; JOURNAL ARTICLE

Abstract: Larval abalone (*Haliotis* spp.) are structurally incapable of ingesting particulate food and the energy necessary for development is thought to come solely from endogenous reserves. These larvae are considered to be energetically independent of the environment and abalone hatcheries raise their larvae in water that has been treated to eliminate bacterial contaminants ("biological filters" and UV-oxidation). As

dissolved organic material in seawater represents the sole source of exogenous energy available to developing abalone, any manipulation that changes the organic chemistry of seawater can have an impact on the larvae. abalone larvae, raised in static batch culture, increase in biomass during the first 2 days of development when raised in seawater that has only been mechanically filtered. Following this initial growth, there was little change in biomass during the remainder of the larval life. Larvae reared in 0.2 µm-filtered seawater, that had previously been treated with a biological filtration system, decreased in biomass during the first 2 days of development. Biomass decreases in larvae raised in biologically-filtered water were reversed by changing the source and treatment (only mechanical filtration) of the seawater.

Descriptors: mollusk culture; molluscan larvae; rearing; water quality

Taxonomic Descriptors: Haliotis

Environment: MARINE

70

Studies on efficacy of Eichhornia crassipes (Mart) Solms in removing heavy metals from aquatic medium and their effects on the plant tissues.

Jamil, K.; Rao, P.V.R.; Jamil, M.Z.

(Regional Research Laboratory, Hyderabad, India)

K.R. Reddy and W.H. Smith, eds.

Source: Aquatic plants for water treatment and resource recovery. Orlando, Fla.: Magnolia Publishing Inc. 1987, p. 479-485.

Languages: English

Report No.: ISBN 0941463001

DNAL Call No.: TD475.C65 1986

71

Effect of an oil-cake (Brassica latifolia) piscicide on the physiochemical and biological spectrum of waterbodies.

Jana, B.B.; Manna, A.K.; Kundu, G.

(Univ. Kalyani, Dep. Zool., Fish. and Limnol. Lab., Kalyani - 741235 West Bengal, India)

Source: LIMNOLOGICA, vol. 18, no. 2, pp. 431-439, (1987).

Languages: English

Summary Languages: German; English; Russian

Document Type: JOURNAL ARTICLE

Abstract: Application of an organic piscicide (*Brassica latifolia*) in the dosage of 2500 kg/ha had resulted in acidic and anaerobic conditions within 16 h to 4 days in both fish ponds and outdoor tanks. The mean values of bicarbonate, total hardness, chloride, phosphate and different forms of nitrogen were greatly increased in concentrations in treated waters compared to normal ones. Both phyto- and zooplankton in nursery pond and phytoplankton in tanks were sharply declined in numbers after day 3-5 of mohua treatment sharp peak was noticed after week 2 of mohua treatment. Among the zooplankters, copepods were most susceptible to the toxicity of mohua treatment, while rotifers and Euglenophyta were highly responsive to the manural effect of mohua treatment.

Descriptors: ichthyocides; toxicity; physicochemical properties; biotesting; phytoplankton; zooplankton; fish ponds

Geographic Descriptors: India, Kalyani

Taxonomic Descriptors: *Brassica latifolia*

Environment: FRESH

72

Effect of heavy metals on population growth of a fish nematode Spinicauda spinicauda in aquatic environment.

Jana, S.; Ghosh, K.

(Darjeeling Government College, Darjeeling, India)

Source: Environment & Ecology. Kalyani, West Bengal: Dept. of Zoology, Kalyani University for MKK Publications. Dec. 1987, v. 5 (4), p. 811-813.

Languages: English

Report No.: ISSN 0970-0420

DNAL Call No.: TD172.E5

73

Forurensing fra fiskeoppdrettsanlegg i sjøe.

(Pollution from fish culture sites in the sea.).

Johannessen, P.; Kryvi, H.

(Inst. Marinbiol., Univ. Bergen, Bergen, Norway, Norsk Fiskeoppdrett, Bergen (Norway))

Source: NORSK FISKEOPPDRETT, vol. 10, no. 3, pp. 32-33, (1985).

Languages: Norwegian

Document Type: Journal Article

Abstract: Some experiments carried out at Hordaland County, Norway, on pollution effects from fish culture sites in the sea are described. Bottom sediments and fauna were analyzed by taking samples from 10 fish culture sites. A grab was used to collect samples. Hydrographical data (temperature, salinity, oxygen content) and sediment data (particle distribution, amount of organic material) were also analyzed. The experiments showed that the pollution effects from fish culture sites in the sea are less than those from sewer systems.

Descriptors: fish culture; aquaculture effluents; pollution surveys

Geographic Descriptors: ANE, Norway

Environment: Marine

74

Bacterial depuration by the hard clam, Mercenaria mercenaria.

Johnson, L.; Hayasaka, S.

(Dep. Microbiol., Clemson Univ., Clemson, SC 29634-1909, USA)

Source: J. Shellfish Res., vol. 7, no. 1, pp. 89-94, (1988).

Languages: English

Summary Languages: English

Document Type: JOURNAL ARTICLE

Abstract: Bacterial loads varied in hard clams *Mercenaria mercenaria* obtained from a South Carolina estuary with lower counts during cooler months and higher counts during warmer months the water source from which clams were taken was considered unpolluted as low levels of fecal coliforms and no salmonella or *Shigella* spp. were detected. *Vibrio parahaemolyticus* was detected only in low numbers in hard clams. Two important parameters considered in depuration were salinity and temperature. clams raised in South Carolina coastal waters provided good depuration results within 24 h at a temperature close to 24 degree C and salinities of 24-31 ppt.

Descriptors: self purification; microbial contamination; clam culture; temperature effects; salinity effects

Geographic Descriptors: ANW, USA, South Carolina

Taxonomic Descriptors: *Mercenaria mercenaria*

Environment: MARINE

75

Cadmium and aluminum in fish body distribution and morphological effects

Karlsson-Norrgren, Leif.

Source: Uppsala: Reklam & Katalogtryck, 1985, 1 v. (various pagings), ill., 24 cm..

Languages: English

Report No.: ISBN 9157623023 (pbk.)

DNAL Call No.: SH171.K37

76

Efficacy of biogas slurry in carp, Cyprinus carpio var. communis (Linn.), culture: Effects on survival and growth.

Kaur, K.; Sehgal, G.K.; Sehgal, H.S.

Source: Biological wastes. London: Elsevier Applied Science Publishers. 1987, v. 22 (2), p. 139-146.

Languages: English

Report No.: ISSN 0269-7483

DNAL Call No.: TD930.A32

77

O vliyani prirody substrata na sodержanie tyazhelykh metallov v myagkikh tranyakh s"edobnoj midii.

On the effect of substrate type on the content of heavy metals in soft tissues of the common mussel *Mytilus edulis*.

Kavun, V.Y.; Khristoforova, N.K.

(Inst. Biol. Morya DVNTs and S.S.S.R., Vladivostok, USSR)

Source: BIOL. MORYA MAR. BIOL. VLADIVOST., no. 3, pp. 5-8, (1987).

Languages: Russian

Summary Languages: English; Russian

Document Type: Journal Article

Abstract: The effect of substrate type on the content of Fe, Zn, Mn, Cu and Cd in soft tissues of the mussel was studied with reference to foulings on wooden and steel pier supports, littoral clods, hydrographic and mooring buoys and rope collectors intended for mariculture purposes. High and variable concentrations of Fe and Mn were recorded in individuals occurring on metal substrates. The accumulation of Zn, Cu and Cd was not substrate-dependent. The results obtained are discussed with due regard to the requirements imposed on indicator species.

Descriptors: heavy metals; bioaccumulation; sediment chemistry

Taxonomic Descriptors: *Mytilus edulis*

Environment: Marine

78

*Suspected toxicopathic hepatic necrosis and megalocytosis in pen-reared Atlantic salmon *salmo salar* in Puget Sound, Washington, USA.*

Kent, M.L.; Myers, M.S.; Hinton, D.E.; Eaton, W.D.; Elston, R.A.

(Battelle Mar. Res. Lab., 439 W. Sequim Bay Rd., Sequim, WA 98382, USA)

Source: DIS. AQUAT. ORG., vol. 4, no. 2, pp. 91-100, (1988).

Languages: English

Document Type: Journal Article

Abstract: Severe liver disease was associated with mortality in Atlantic salmon *salmo salar* maintained in seawater net pens in Port Townsend Bay, Washington, USA. Approximately 2 mo after seawater

introduction prominent diffuse hydropic degeneration and pyknosis of hepatocytes were observed in moribund fish. As the disease progressed, the livers of affected fish exhibited multifocal areas of regenerating hepatocytes intermixed throughout a necrotic parenchyma. The lesions were consistent with toxicopathic changes bacterial and viral examinations revealed no infectious agent associated with the liver damage. The source of the suspected toxicant was most likely direct water contact or natural food rather than the commercial feed because the liver lesions were not detected in Atlantic salmon fed the same commercial diet but reared at a different seawater location (Port Angeles, Washington).

Descriptors: pollution effects; cage culture; fish culture; mortality; histopathology; necroses; liver; anthropogenic factors; fish diseases; lesions

Geographic Descriptors: INE, Puget Sound

Taxonomic Descriptors: salmo salar

Environment: Marine

79

Shellfish health and protection. 1989 Annu. Meet. of the National shellfisheries Association Los Angeles, CA (USA) 12 Feb. 1989.

Kern, F.G.; Rosenfield, A.

(NMFS, Oxford Lab., Oxford, MD, USA)

Source: J. Shellfish Res., vol. 7, no. 3, pp. 557-558, (1988).

Languages: English Summary only

Document Type: CONFERENCE; SUMMARY; JOURNAL ARTICLE

Abstract: The role of humans in the dispersal and enhancement of aquatic animal pathogens, pests, predators, and competitors that may adversely affect the productivity and quality of living marine resources is of particular concern to fishery biologists and resource managers. More recent concerns involve the accidental or deliberate introduction into marine ecosystems of exotic and genetically manipulated species of micro- and macroorganisms. Some introductions have proved beneficial, but others have caused significantly harmful effects on resident biota and/or their habitats. The above concerns as well as the origins (sources) of "biological pollution" of marine ecosystems will be discussed, with special reference to the need for developing risk assessment and risk management strategies. Other discussion points will include federal-state interactions regarding shellfish transports between U.S. coasts, territories, and individual states.

Descriptors: biotechnology; genetics; introduced species; pathogens; shellfish; transportation

Geographic Descriptors: USA

Environment: MARINE; FRESH

80

Mineral nutrition: Effects of phosphorus in trout and salmon feeds on water pollution. Int. Symp. on Feeding and Nutrition in Fish Aberdeen (UK) 10 July 1984.

Ketola, H.G.

(Tunison Lab. Fish. Nutr., U.S. Fish and Wildl. Serv., 28 Gracie Rd., Cortland, NY 13045, USA)

Cowey, C.B.; Mackie, A.M.; Bell, J.G., eds.

Source: NUTRITION AND FEEDING IN FISH, 1985, pp. 465-473.

Languages: English

Document Type: Conference; Book

Report No.: ISBN 0-12-194055-1

Abstract: An examination is made of the effects of fish hatchery diets on the pollution of effluent waters with phosphorus. Experiments with rainbow trout and coho salmon testing 4 different diets showed the possible efficacy of phosphorus-reduced diets, which resulted in a 50% reduction of phosphorus pollution.

Descriptors: fish culture; feed composition; hatcheries; phosphorus; aquaculture effluents
Environment: Fresh

81

Rejets thermiques dans le milieu marin cotier: Aperçu sur l'expérience acquise sur le site de Gravelines (nuclear power plant).

Thermal discharges into the coastal area: Overview of results from the (nuclear) power plant at Gravelines.; Adaptation des Etres Marins aux Eaux Chaudes; Paris (France); 26 Nov. 1987.

Khalanski, M.

(Electr. Fr., Dir. Etud. Rech., Dep. Environ. Aquat. Atmos., 6, Quai Watier, 78401 Chatou Cedex, France)

Source: OCEANIS (DOC. OCEANOGR.), vol. 14, no. 5, 1988, pp. 579-593.

ADAPTATION DES ETRES MARINS AUX EAUX CHAUDES: SEMINAIRE 26 NOVEMBRE 1987.

(ADAPTATION OF MARINE ORGANISMS TO WARM WATERS: SEMINAR, 26 NOVEMBER 1987)

Languages: French; English

Document Type: CONFERENCE; BOOK

Abstract: This paper presents the main results of studies carried out in order to assess the ecological impact of the thermal discharges from the nuclear power plant at Gravelines. The impact is assessed regarding heating and its effects on bacteria, plankton and benthic organisms. Some observations on fishes entering the discharge channel are recorded. A brief presentation of the use of heated water for aquacultural purposes at Gravelines is given.

Descriptors: thermal pollution; nuclear power plants; thermal aquaculture; coastal zone; ecosystems; plankton; benthos; environmental factors

Geographic Descriptors: ANE, France, Nord, Gravelines

Taxonomic Descriptors: bacteria

Environment: MARINE

82

National collaborative study of the relationships of indicators, human enteric pathogens and potential health risks in shellfish and growing waters.; 1988 Annu. Meet. of the Natl. shellfisheries Assoc.; New Orleans, LA (USA); 26 June 1988.

Kilgen, M.B.

(Dep. Biol. Sci., Nicholls State Univ., Thibodaux, LA 70310, USA)

Source: J. Shellfish Res., vol. 7, no. 1, p. 201, (1988).

Languages: English

Document Type: CONFERENCE; SUMMARY; JOURNAL ARTICLE

Abstract: Classification of shellfish growing waters is meant to insure the sanitary quality of shellfish by monitoring raw sewage contamination of these waters. Problems with the current method of classification of shellfish growing waters have caused significant lack of confidence in the system by industry, regulatory officials, university researches and the consumer public. The need for a national collaborative study to re-evaluate the methods used for growing water classification has been advised for many years. This project will be a 4 year collaborative study to evaluate the current relationships between indicators of sewage contamination, and human enteric pathogens within a total environmental assessment of commercial shellfish growing areas. It will be determined if the current shellfish fecal coliform standards and guidelines are still the most valid and reliable indicators of potential health risk from sewage-related enteric pathogens in the sanitary and epidemiological conditions existing throughout important shellfish growing waters in this country today.

Descriptors: shellfish culture; water quality; pollution monitoring; microbial contamination; pathogenic

bacteria; public health; research proposals; sewage; pollution effects; marine pollution; government policy; aquaculture regulations

Geographic Descriptors: USA Coasts

Environment: MARINE

83

Effect of nitrogen/phosphorus ratio of the culture medium on growth and nutrient removal by water hyacinth.
Knoll, D.M.

(San Diego State University, Spring Valley, CA)

K.R. Reddy and W.H. Smith, eds.

Source: Aquatic plants for water treatment and resource recovery. Orlando, Fla.: Magnolia Publishing Inc., 1987, p. 657-663.

Languages: English

Report No.: ISBN 0941463001

DNAL Call No.: TD475.C65 1986

84

The effect of mixing and aeration on the productivity of Myriophyllum heterophyllum Michx. (water milfoil) during aquatic wastewater treatment.

Kozak, P.M.; Bishop, P.L.

(Department of Civil Engineering, Durham, NH)

K.R. Reddy and W.H. Smith, eds.

Source: Aquatic plants for water treatment and resource recovery. Orlando, Fla.: Magnolia Publishing Inc. 1987, p. 445-452.

Languages: English

Report No.: ISBN 0941463001

DNAL Call No.: TD475.C65 1986

85

Resurs budushchego. (Morskaya voda. Ehffektivnost' osvoeniya).
(Prospects of sea water utilization.).

Kryzhanovskij, R.A.

Source: PUBL: MYSL', MOSKVA (USSR), 1985, 172 pp.

Languages: Russian

Summary Languages: Russian

Document Type: Book

Abstract: The book falls into 6 chapters dealing with effectiveness of sea water utilization in industry, agriculture and mariculture. Methods of decreasing sea water salinity in coastal areas of the World Ocean are described.

Descriptors: marine resources; resource development; sea water

Geographic Descriptors: World Ocean

Environment: Marine

86

People's Republic of China. Guide to marine finfish hatchery management. Prepared for the project Development of Marine Culture of Fish.

Kungvankij, P.

Source: FAO, Rome, Italy, 1988, 15 pp. (FAO FI/DP/CPR/81/014-field-doc-3.)

Languages: English

Document Type: Training Document; Report

Abstract: Details are given of project activities conducted regarding the setting up of a fish culture hatchery for marine fish in the coastal areas of China. To ensure effective operation, the following facilities were required: holding tanks, seawater intake system, water supply system and aeration system. Management of the various phases involved in hatchery operation is discussed in detail, considering: 1) broodstock development 2) collection of wild broodstock 3) broodstock 4) spawning and fertilization 5) spawning 6) fertilization and incubation 7) larval rearing 8) factors affecting mass rearing and 9) rearing environment.

Descriptors: fish culture; hatcheries; aquaculture techniques; marine aquaculture

Geographic Descriptors: ISEW, China, People's Rep.

Environment: Marine

87

The effect of thallium on the growth of Lemna minor and plant tissue concentrations in relation to both exposure and toxicity.

Kwan, K.H.M.; Smith, S.

Source: Environmental pollution. Series A: Ecological and biological. Essex: Elsevier Applied Science. 1988, v. 52 (3), p. 203-219.

Languages: English

Report No.: ISSN 0269-7491

DNAL Call No.: QH545.A1E52

88

Proceedings of the Thirteenth Annual Aquatic toxicity Workshop November 12-14, 1986, Moncton, New Brunswick / editor, J.S.S. Lakshminarayana = Compte rendu des communications du treizieme Atelier annuel sur la toxicite aquatique : du 12 au 14 novembre 1986, Moncton, Nouveau-Brunswick / editeur, J.S.S. Lakshminarayana.

Compte rendu des communications du treizieme atelier annuel sur la toxicite aquatique.

Lakshminarayana, J. S. S.

(Canada. Dept. of Fisheries and Oceans)

Source: Aquatic toxicity Workshop (13th: 1986: Moncton, N.B.). xvi, 178 p., ill., maps.

[Ottawa]: Fisheries and Oceans, 1987. Canadian technical report of fisheries and aquatic sciences = Rapport technique Canadien des sciences halieutiques et aquatique, no. 1575

Canadian technical report of fisheries and aquatic sciences; no. 1575.

Languages: English; French

Report No.: LCCN ce 88070508; ISSN 0706-6457; VtU Call No.: SH223.C262 no. 1575

89

Effect of environmental pollutants on the chemiluminescence of hemocytes from the American oyster Crassostrea virginica.

Larson, K.G.; Roberson, B.S.; Hetrick, F.M.

(Dep. Microbiol., Univ. Maryland, College Park, MD 20742, USA)

Source: DIS. AQUAT. ORG., vol. 6, no. 2, pp. 131-136, (1989).

Languages: English

Document Type: JOURNAL ARTICLE

Abstract: An assay measuring the chemiluminescent response of hemocytes from the oyster *Crassostrea virginica* was used to assess the effects of environmental pollutants on phagocytosis. In vivo and in vitro effects of heavy metals (copper, cadmium, zinc, and aluminum), pesticides (dieldrin and chlordane), and organic compounds (naphthalene and 2,4-dinitrophenol) on the chemiluminescent response of stimulated oyster hemocytes were tested. Instances of both acclimation and cumulative toxicity of pollutants were observed.

Descriptors: pollution effects; animal physiology; blood cells; chemiluminescence; heavy metals; pesticides; dieldrin; organic compounds

Taxonomic Descriptors: *Crassostrea virginica*

Environment: MARINE

90

Assessing the effectiveness of depuration of polluted clams and mussels using the Microtox bioassay

Lau-Wong, M.M.

(Hong Kong Government, Wanchai, Hong Kong)

Source: Bulletin of environmental contamination and toxicology. New York, N.Y.: Springer-Verlag. June 1990, v. 44 (6), p. 876-883, maps.

Languages: English

Report No.: ISSN 0007-4861

DNAL Call No.: RA1270.P35A1

91

*Differential fitness of allelic isozymes in the marine gastropods *Littorina punctata* and *Littorina neritoides*, exposed to the environmental stress of the combined effects of cadmium and mercury pollution.*

Lavie, B.; Nevo, E.

Source: Environmental management. New York: Springer-Verlag. July 1987. v. 11 (3), p. 345-349.

Languages: English

Report No.: ISSN 0364-152X

DNAL Call No.: HC79.E5E5

92

Observations on the use of antifouling paint in netcage fish farming in Singapore.

Lee, H.B.; Lim, L.C.; Cheong, L.

(Aquacult. Unit, Fish. Complex, 300 Nicoll Dr., Singapore 1749, Singapore)

Source: SINGAPORE J. PRIMARY IND., vol. 13, no. 1, pp. 1-12, (1985).

Languages: English

Document Type: Journal Article

Abstract: Two antifouling paints of tributyl tin compound were tested out on floating netcages stocked with seabass, *Lates calcarifer*, off Pasir Ris, Singapore. Results showed that both paints effectively controlled fouling within the first 2 months of net immersion but became ineffective after the third month when fouling set in. At the second month, weight of fouling matter in treated nets was significantly less than in non-treated nets, averaging 1 kg/net and 91 dg/net respectively. Growth rates of fish in treated and

non-treated nets differed slightly, averaging 0.83 g/day and 0.74 g/day respectively. Levels of tin and other heavy metals (mercury and lead) were similar for fish in treated and non-treated nets.

Descriptors: fish culture; cage culture; fouling control

Geographic Descriptors: ISEW, Singapore

Taxonomic Descriptors: *Lates calcarifer*

Environment: Marine

93

Physiological effects in fish exposed to effluents from mills with six different bleaching processes.

Lehtinen, K.J.; Kierkegaard, A.; Jakobsson, E.; Wandell, A.

(Finnish Environmental Research Group, Vanda, Finland)

Source: Ecotoxicology and environmental safety. Duluth, Minn.: Academic Press. Feb 1990, v. 19 (1), p. 33-46.

Languages: English

Report No.: ISSN 0147-6513

DNAL Call No.: QH545.A1E29

94

Algae as weeds: Economic impact, ecology, and management alternatives.

Lembi, C.A.; O'Neal, S.W.; Spencer, D.F.

(Purdue University, West Lafayette, IN)

Carole A. Lembi, J. Robert Waaland, eds.

Source: Algae and human affairs. Cambridge: Cambridge University Press, 1988, p. 455-481. (Sponsored by the Phycological Society of America, Inc.)

Languages: English

Report No.: ISBN 0521321158

DNAL Call No.: SH390.7.A43

95

Fish farming in Finland.

Lindqvist, O.V.

Source: CAN. TRANSL. FISH. AQUAT. SCI., no. 5273, 1986, 7 pp. (Transl. Fi-En: Vesihallituksen monistesarja: 241, 1984, 5-8.)

Languages: English

Document Type: Book

Report No.: ISSN 0704-3716

Abstract: The author discusses the present state of fish farming in Finland, water pollution control, and the economic prospects for future growth in the industry. (Available from: Canada Inst. Sci. Tech. Inf., Natl. Res. Council, Ottawa, Ont. K1A 0S2.)

Descriptors: fish culture; water quality control; pollution effects; translations

Geographic Descriptors: Finland

Environment: Marine; Fresh

Identifiers: pollution control; economic analysis

96

Die Auswirkungen von anthropogenen Gewässerversauerungen auf die Ichthyofauna - insbes. der Bachforelle (Salmo trutta f. fario L.) – in ausgesuchten Mittelgebirgsbaeichen.

(Impact of anthropogenic water acidification on the ichthyofauna of selected Westphalian running waters, with particular consideration of sea trout (*Salmo trutta f. trutta*)).

Lubieniecki, B.; Steinberg, L.

(Landesanst. Fisch. NRW, Albaum, FRG)

Source: FISCHWIRT., vol. 37, no. 4, pp. 25-30, (1987).

Languages: German

Document Type: Journal Article

Abstract: A number of small running waters in Westphalia (Germany, Fed. Rep.) were selected for a long-term monitoring programme on the impact of acid rain and water acidification with emphasis on salmonid *Salmo trutta*, hatching in the natural environment. For this purpose water and sediment analysis were taken continuously. As a result, the pH of snow was found to be under 5.0 and the rain in the range of 4.2-4.3. No direct correlation was found between the survival rate of salmonid eggs and the measured parameters.

Descriptors: acidification; sediment texture; regional variations; sedimentation; pollution effects

Geographic Descriptors: Germany, Fed. Rep., Westphalia

Taxonomic Descriptors: *Salmo trutta*

Environment: Fresh

97

Methods for testing toxicity in fish.

Metody issledovaniï toksichnosti na rybakh / perevod s nemetskogo pod redaktsiei V.I. Luk'ianenko

Luk'ianenko, V. I.

Source: Moskva: Agropromizdat. 1985. 117 p., ill.

Languages: Russian

DNAL Call No.: RA1221.M431

98

Ecological aspects of ichthyotoxicology.

Ekologicheskie aspekty ikhtiotoksikologii.

Luk'ianenko, V. I.

Source: Moskva: Agropromizdat. 1987. 237 p., ill.

Languages: Russian

DNAL Call No.: SH174.L84

99

Effect of increasing copper and salinity on glycerol production by Dunaliella salina.

Lustigman, B.; McCormick, J.M.; Dale, G.; McLaughlin, J.J.A.

Source: Bulletin of environmental contamination and toxicology. New York, N.Y.: Springer-Verlag. Feb. 1987, v. 38 (2), p. 359-362.

Languages: English

Report No.: ISSN 0007-4861

DNAL Call No.: RA1270.P35A1

100

Shellfish resource degradation as a function of land use practices.

Macfarlane, S.L.

(Town of Orleans Shellfish Dep., Orleans, MA 02653, USA)

Source: J. Shellfish Res., vol. 7, no. 1, p. 198, (1988). 1988 Annu. Meet. of the Natl. Shellfisheries Assoc.; New Orleans, LA (USA); 26 Jun 1988.

Languages: English

Document Type: CONFERENCE; SUMMARY; JOURNAL ARTICLE

Abstract: Environmental degradation with respect to shellfish resources is becoming a serious problem on Cape Cod as a direct result of rapid coastal development. Over 5,000 acres were closed to shellfishing in 1987 compared to 712 acres in 1980. Closures were due to bacterial contamination from such sources as stormwater runoff, inadequate on-site septic systems and warm-blooded animals. In addition, shellfish habitat is being lost due to eutrophication from nutrient enrichment caused by the cumulative effects of current land use practices. Individual communities and the entire county are beginning massive educational and action-oriented programs to ameliorate the situation. But research is needed in a wide range of disciplines to maintain high water quality standards and a viable shellfish industry.

Descriptors: shellfish culture; water quality; pollution effects; environmental impact; land use; pollution control; marine pollution

Geographic Descriptors: ANW, USA, Massachusetts, Cape Cod

Environment: MARINE

101

Sieving as an effluent treatment method for aquaculture.

Maekinen, T.; Lindgren, S.; Eskelinen, P.

(Fin. Game Fish. Res. Inst., Laukaa Fish Cult. Res. Stn., SF-41360 Valkola, Finland)

Source: AQUACULT. ENG., vol. 7, no. 6, pp. 367-377, (1988).

Languages: English

Summary Languages: English

Document Type: Journal Article

Abstract: A new device designed for sieving of fish farm effluent (trademark Triangel Filter TF 2400) was tested in order to prove if such an apparatus may be used instead of the swirl concentrator. The phosphorus reduction was estimated by water sampling and phosphorus budget and by measuring the phosphorus content in flushing water and in settled sludge. sieving is a promising and useful method to treat aquaculture effluent, especially in "high-tech" systems (recirculation, warmed water facilities) where high effluent quality and the most effective removal of solids is needed.

Descriptors: waste treatment; aquaculture effluents; fish culture; aquaculture systems

Environment: Fresh

102

Pollution threat of heavy metals in aquatic environments.

Mance, Geoffrey.

Source: Pollution monitoring series. Elsevier Applied Science; London; New York, NY: Sole distributor in the USA and Canada Elsevier Science. 1987. xii, 372 p., ill.

Languages: English

Report No.: LCCN: 86024131; ISBN: 1851660399; [bp]42.00

DNAL Call No.: QH545.H42M26

103

Determination au moyen de tests biologiques de facteurs nutritionnels intervenant dans la composition spécifique des peuplements phytoplanctoniques printaniers en baie de Bourgneuf.

(Bioassay determination of nutritional factors controlling the specific composition of spring phytoplanktonic populations in the Bay of Bourgneuf).

Marion, A.; Robert, J.M.

(Lab. Biol. Mar. U.E.R. Sci. Nat., 2 Rue de la Houssiniere, 44072 Nantes Cedex, France)

Source: J. RECH. OCEANOGR., vol. 10, no. 3, pp. 88-91, (1985).

Languages: French

Summary Languages: English; French

Document Type: Journal Article

Abstract: Water samples were collected in the Bay of Bourgneuf, during spring, in June 1983. Six sampling stations were chosen, along an axis from the oceanic waters to the coast and the oyster-ponds.

Physico-chemical parameters, nutrient content and fertility were estimated for each station, in order to determine variations in biological potentialities of oceanic waters before, then after, mixing with the near-shore waters, as far as the littoral marshes where oyster ponds are located. Algal bioassays, carried out on natural communities collected at each station, made it possible to determine the effects of nutrients and organic matter excreted by oysters on the microalgal production, particularly the diatom *Skeletonema costatum* (Grev.) Cleve.

Descriptors: bioassays; phytoplankton; oyster culture; nutrients (mineral); algae

Geographic Descriptors: ANE, France, Bourgneuf Bay

Taxonomic Descriptors: *Skeletonema costatum*

Environment: Marine

104

Possible effects of organotins on scallop recruitment.

Minchin, D.; Duggan, C.B.; King, W.

(Fish. Res. Cent., Dep. Mar. Sci., Abbotstown, Dublin 15, Eire)

Source: MAR. POLLUT. BULL., vol. 18, no. 11, pp. 604-608, (1987).

Languages: English

Summary Languages: English

Document Type: Journal Article

Abstract: The adult populations of the scallop (*Pecten maximus*) and of flame shells (*Lima hians*) have declined in the North Water of Mulroy Bay on the north coast of Ireland. Settlements of these and some other bivalve species either failed or were reduced. These events relate well to the first introduction and subsequent increased use of organotin net-dips on salmonid farms in this Bay. The last use of these net-dips was during the spring of 1985. In 1986 there was a good settlement of scallops, and settlements of other bivalves were recorded except for flame shells. Levels of TBT in adult scallop tissue in the North Water are high, 0.7 $\mu\text{g/g}$ super(-1) wet wt levels determined in other species were much lower.

Descriptors: recruitment; pollution effects; antifouling substances; tin compounds; marine pollution; fish culture

Geographic Descriptors: ANE, Eire, Donegal Cty., Mulroy Bay, North Water

Taxonomic Descriptors: *Pecten maximus*; *Lima hians*

Environment: Marine

Identifiers: organotin compounds

105

Effect of chemically contaminated marine sediment on naupliar production of the marine harpacticoid copepod, Tigriopus californicus.

Misitano, D.A.; Schiewe, M.H.

(National Oceanic and Atmospheric Administration, Seattle, WA)

Source: Bulletin of environmental contamination and toxicology. New York, N.Y.: Springer-Verlag. Apr 1990, v. 44 (4), p. 636-642.

Languages: English

Report No.: ISSN 0007-4861

DNAL Call No.: RA1270.P35A1

106

Effect of heavy metal ions on enzyme activity in the Mediterranean mussel, Donax trunculus.

Mizrahi, L.; Achituv, Y.

(Bar Ilan University, Ramat-Gan, Israel)

Source: Bulletin of environmental contamination and toxicology. New York, N.Y.: Springer-Verlag. June 1989, v. 42 (6), p. 854-859.

Languages: English

Report No.: ISSN 0007-4861

DNAL Call No.: RA1270.P35A1

107

Managed coastal waters for oyster culture in Japan.

Mori, K.

(Fish Nutr. Div., Natl. Res. Inst. Aquacult., Nansei, Mie 516-01, Japan)

Michael, R.G., ed.

Source: ECOSYST. WORLD, vol. 29, 1987, pp. 125-143.

MANAGED AQUATIC ECOSYSTEMS.

Languages: English

Document Type: Book

Report No.: ISBN 0-444-42517-9

Abstract: The management of Japanese coastal waters for culture of Crassostrea gigas is discussed in detail, describing the various culture systems used. Effects of the culture activities on the coastal waters are examined, considering alterations in the ecosystem and deterioration of oyster culture areas. The effects of artificial eutrophication on culture production in the coastal waters are also considered.

Descriptors: oyster culture; aquaculture systems; ecosystem management; coastal waters; eutrophication; biological production

Geographic Descriptors: INW, Japan

Taxonomic Descriptors: Crassostrea gigas

Environment: Marine

108

Effects of surface-active agents on the salinity tolerance of water hyacinth (Eichhornia crassipes).

Muramoto, S.; Oki, Y.

Source: Journal of environmental science and health. Part A. Environmental science and engineering. New York, N.Y.: Marcel Dekker. 1988, v. 23 (6), p. 603-611, ill.

Languages: English
Report No.: ISSN 0360-1226
DNAL Call No.: TD172.J6

109

Yoshoku nori seiiku ni oyobosu enso sakkin toshi gesui-shorisui no eikyo.

(Effects of the effluent of chlorinated sewage on the growth of *Porphyra yezoensis*).

Murayama, T.; Miura, A.; Yoshida, T.

(Tokyo Univ. Fish., Konan-4, Minato, Tokyo 109, Japan)

Source: NIPPON SUISAN GAKKAISHI BULL. JAP. SOC. SCI. FISH., vol. 53, no. 3, pp. 465-472, (1987).

Languages: Japanese

Summary Languages: English; Japanese

Document Type: Journal Article

Abstract: The effects of chlorinated effluent of activated sludge treatment on the growth of *Porphyra yezoensis* were investigated with different chlorinated effluent-dosed culture media and different chlorine-dosed, diluted Prvasoli's Enriched Seawater (PES) culture media as a control, by means of a shaking culture. Initial chlorine concentrations that manifested a 50% growth effect and 50% dead cells in chlorinated effluent-dosed culture and chlorinated-dosed diluted PES culture were 0.025-0.035 mg Cl sub(2)/l and 0.06 mg Cl sub(2)/l, and 0.75-0.95 mg Cl sub(2)/l and 1.5-3 mg Cl sub(2)/l, respectively. The growth effect and dead cells manifestation were dependent on the initial chlorine concentrations in both cultures.

Descriptors: toxicity tests; chlorine compounds; sewage; chlorination

Taxonomic Descriptors: *Porphyra yezoensis*

Environment: Marine

110

Effects of bleached kraft mill effluent (BKME) on the schooling behavior of vendace (Coregonus albula L.).

Myllyvirta, T.P.; Vuorinen, P.J.

Source: Bulletin of environmental contamination and toxicology. New York, N.Y.: Springer-Verlag. Feb. 1989, v. 42 (2), p. 262-269, ill.

Languages: English

Report No.: ISSN 0007-4861

DNAL Call No.: RA1270.P35A1

111

Impact of "tambak" aquaculture to the mangrove ecosystem and its adjacent areas with special reference to the north coast of West Java.

Naamin, N.

(Res. Inst. Mar. Fish., Jl. Krapu no. 12, Sunda Kelapa, Jakarta 14430, Indonesia)

Source: MANGROVES OF ASIA AND THE PACIFIC: STATUS AND MANAGEMENT. TECHNICAL REPORT OF THE UNDP/UNESCO RESEARCH AND TRAINING PILOT PROGRAMME ON MANGROVE ECOSYSTEMS IN ASIA AND THE PACIFIC (RAS/79/002). (Iss. in coop. with National Mangrove Comm., Quezon City (Philippines)). 1986, pp. 355-365.

Languages: English

Document Type: Book

Abstract: A description is given of tambak culture systems in western Java, discussing negative and positive impacts on the mangrove ecosystem. Socio-economical implications and management measures are also

considered.

Descriptors: mangrove swamps; brackishwater aquaculture; shrimp culture; environmental impact; sociological aspects

Geographic Descriptors: ISEW, Indonesia, Java

Environment: Brackish

112

Effects of pulp mill effluent on a Baltic coastal fish community.

Neuman, E.; Karas, P.

Source: Water science and technology: A journal of the International Association on Water pollution Research. Oxford: Pergamon Press. 1988, v. 20 (2), p. 95-106, maps.

Languages: English

Report No.: ISSN 0273-1223

DNAL Call No.: TD420.A1P7

113

Cadmium uptake and toxicity to water hyacinth: Effect of repeated exposures under controlled conditions.

Nir, R.; Gasith, A.; Perry, A.S.

(Tel-Aviv University, Ramat-Aviv, Israel)

Source: Bulletin of environmental contamination and toxicology. New York, N.Y.: Springer-Verlag. Jan 1990, v. 44 (1), p. 149-157.

Languages: English

Report No.: ISSN 0007-4861

DNAL Call No.: RA1270.P35A1

114

Aquatic toxicology and water quality management.

Nriagu, Jerome O.; Lakshminarayana, J. S. S., eds.

Source: Workshop on Aquatic Toxicology (13th: 1987?: Moncton, N.B.). Advances in environmental science and technology. New York: Wiley. c1989, v. 22, xiv, 292 p., ill., map.

Languages: English

Report No.: LCCN: 88007282; ISBN: 047161551X

DNAL Call No.: TD180.A3 v.22

115

*The effect of liquid petroleum refinery effluent on fingerlings of *Sarotherodon melanotheron* (Ruppel 1852) and *Oreochromis niloticus* (Linnaeus 1757).*

Ojuola, E.A.; Onuoha, G.C.

(Fed. Dep. Fish., P.M.B. 0240, Bauchi, Bauchi State, Nigeria; UNDP/FAO/NIOMR African Reg. Aquaculture Cent. (ARAC), Port Harcourt (Nigeria))

Source: UNDP/FAO/NIOMR, PORT HARCOURT (NIGERIA), 1987, 14 pp. UNDP/FAO/NIOMR ARAC/87/WP/8. 20 ref.

Languages: English

Summary Languages: English

Document Type: Numerical data; Book

Abstract: Toxicity of petroleum refinery effluent from Alesa-Elme (Port Harcourt) Refinery, to *Oreochromis niloticus* and *Sarotherodon melanotheron*, were investigated at an average temperature of 27 degree C plus or minus 2.5 degree C under lab conditions. LT sub(50) values increased from 29' min at 100% effluent concentration to 645 min at 10% effluent concentration (Vol/Vol) for *O. niloticus* and from 48 min at 100% to 1,917 min at 10% for *S. melanotheron*. toxicity of effluent to fish decreased as the effluent aged. LT sub(50) for 2-day and 6-day old effluent for *O. niloticus* at 63.1% effluent concentration were 30 and 70 min respectively. LC sub(50) obtained from regressions of effluent concentrations and LT sub(50) for 6-day old effluent at 24, 48 and 96 h were 5.6, 3.29 and 1.93% respectively for *O. niloticus*, while the corresponding values for *S. melanotheron* were 9.48, 5.83 and 3.6% respectively. The safe concentrations of 6 and 15-day old effluents were estimated as 0.19 and 0.29% respectively for *O. niloticus*, while the corresponding values were 0.36 and 0.35 for *S. melanotheron*. The 24 and 48 h LC sub(50) values show that *S. melanotheron* is more resistant to oil refinery effluent than *O. niloticus*.

Descriptors: oil refineries; industrial wastes; pollution effects; toxicity tests

Taxonomic Descriptors: *Oreochromis niloticus*; *Sarotherodon melanotheron*

Environment: Fresh

116

Uptake and metabolism of phenolic compounds by the water hyacinth (Eichhornia crassipes).

O'Keeffe, D.H.; Wiese, T.E.; Brummet, S.R.; Miller, T.W.

Source: Recent advances in phytochemistry. New York, N.Y.: Plenum Press. 1987, v. 21, p. 101-129, ill.

Languages: English

Report No.: ISSN 0079-9920

DNAL Call No.: QK865.A1R4

117

Micro-algae and waste-water treatment.

Oswald, W.J.

(Sanit. Eng. and Environ. Health Lab., Sch. Public Health, Univ. California, Berkeley, CA 94720, USA)

Source: MICRO-ALGAL BIOTECHNOLOGY.

Borowitzka, M.A.; Borowitzka, L.J., eds., 1988, pp. 305-328

Languages: English

Document Type: Book

Report No.: ISBN 0-521-32349-5

Abstract: A brief account is given of the sources of waste water, their polluting characteristics and methods of measuring their polluting effects, examining also the more conventional techniques used in their treatment and disposal before algal systems were developed. A detailed description is given of how algal systems are designed to enhance sedimentation and disinfection and to provide the oxygen needed by bacteria to carry out biological oxidation. Some negative aspects of improperly designed and operated algal systems are also considered.

Descriptors: wastewater treatment; wastewater aquaculture; algal culture; aquaculture systems; biotechnology; oxidation; microbial contamination

Taxonomic Descriptors: algae; bacteria

Environment: Marine; Brackish; Fresh

118

Observations on sediment accumulation as a result of mollusk culture systems in France.; Int. Symp. on Utilization of Coastal Ecosystems: Planning, pollution, and Productivity; Rio Grande, RS (Brazil); 21 Nov 1982.

Ottmann, F.; Sornin, J.M.

(Univ. Nantes, Lab. Geol. Mar. Apl., Nantes Cedex, France)

Labish Chao, N.; Kirby-Smith, W., eds.

Source: Proceedings of the Int. Symposium on utilization of coastal ecosystems: Planning, pollution, and productivity, 1985, vol. 1, pp. 329-337.

Languages: English

Document Type: BOOK

Report No.: ISBN 85-85042-07-9

Abstract: The hydrological modifications, biogenic changes in sediments and their effects on geochemistry and rheology of mud as a result of oyster culture are reviewed. These are: a great increase in sedimentation rate, major resistance to erosion amplified by flow of water draining from the mounds between the rills, and a decrease in mechanical erosion. All these factors raise the bottom on the order of 30-50 cm/year. Thus the culture tables are quickly submerged by mud. The production of hydrogen sulphide can destroy cultures in small or poorly circulating bay waters.

Descriptors: marine aquaculture; oyster culture; off-bottom culture; sedimentation

Geographic Descriptors: ANE, France

Taxonomic Descriptors: Ostrea

Environment: MARINE

119

Effect of aquatic plants on secondary sewage effluent.

Owen, C.; Anderson, L.

(USDA, ARS, Aquatic Weed Laboratory)

Source: Mosquito control research, annual report. Davis, Calif.: University of California. 1986, p. 54-55.

Languages: English

Report No.: ISSN 0886-6309

DNAL Call No.: RA640.M4

120

Effects of two mercuric water pollutants on growth and cell division of Hydrilla verticillata.

Pal, R.; Nandi, S.

(Burdwan University, West Bengal, India)

Source: Cytologia: International journal of cytology. Tokyo. Sept 1989, v. 54 (3), p. 581-586, ill.

Languages: English

Report No.: ISSN 0011-4545

DNAL Call No.: 442.8 C99

121

Reduction of the loading effects of fish farming – a literature review.

Parjala, E.

Source: CAN. TRANSL. FISH. AQUAT. SCI., no. 5252, 1986, 17 pp.

Transl. Fi-En: Vesitalous 5: 11-16, 1984.

Languages: English

Summary Languages: English

Document Type: Review; Book

Report No.: ISSN 0704-3716

Abstract: Much attention has been paid lately to the loading effect of fish farms on waters. There is a general trend towards reducing the load, especially that caused by phosphorus. Therefore, testing and development of different wastewater treatment methods have been carried out at fish farms. Initiatives have been made to find more comprehensive means of reducing the load by considering the entire establishment and its operation. This has resulted in the development of new types of farms, rearing structures, and feeds (Kera 1983). The creation of efficient wastewater treatment methods has been limited by the very large quantities of water involved (the biggest farms use several m³ per second) and the very low contents of contaminants in the wastewater (clearly lower than e.g. in municipal wastewaters) (Parjala et al. 1984 b.). The present article evaluates, primarily on the basis of the literature, the applicability of the different methods for reducing the loading effect of fish farming. (Available from: Canada Inst. Sci. Tech. Inf., Natl. Res. Council, Ottawa, Ont. K1A 0S2.)

Descriptors: fish culture; aquaculture effluents; literature reviews; translations

Environment: Marine

Identifiers: pollution control

122

A study of the zoobenthos in the environment of fish farms in the sea off Sipoo.

Partanen, P.

Source: CAN. TRANSL. FISH. AQUAT. SCI., no. 5267, 1986, 26 pp.

Transl. Fi-En: Vesihallituksen monistesarja: 297, 1984, 30 pp.

Languages: English

Summary Languages: English

Document Type: Book

Report No.: ISSN 0704-3716

Abstract: The author of the zoobenthos study examines the quality and the pollution degree of the bottom in the study area and the effect of fish farming on these, considering also other loads received by the area. (Available from: Canada Inst. Sci. Tech. Inf., Natl. Res. Council, Ottawa, Ont. K1A 0S2.)

Descriptors: fish culture; pollution effects; zoobenthos; translations

Geographic Descriptors: ANE, Finland, Sipoo Bay

Environment: Marine

123

Effects of copper- and tin-based anti-fouling compounds on the growth of scallops (Pecten maximus) and oysters (Crassostrea gigas).

Paul, J.D.; Davies, I.M.

(Sea Fish Ind. Auth., Mar. Farming Unit, Ardtoe, Acharacle, Argyll PH36 4LD, UK)

Source: AQUACULTURE, vol. 54, no. 3, pp. 191-203, (1986).

Languages: English

Summary Languages: English

Document Type: Journal Article

Abstract: Fouling is an important problem in shellfish cultivation. This paper gives the results of growth trials of adult and juvenile scallops (*Pecten maximus*) and adult Pacific oysters (*Crassostrea gigas*) in enclosures treated with various anti-fouling compounds: copper(I) oxide-based paint, bis-(tri-n-butyltin) oxide (TBT)-based paint, and copper-nickel alloy mesh trays. With the copper oxide treatment there was some increase in the growth of scallop spat, but no effect was observed on the growth of adult scallops or Pacific

oysters. The copper-nickel trays, however, caused high mortalities and inhibited growth in adult scallops, but had no effect on oysters. The TBT paint was detrimental to the growth and survival of juvenile scallops, and caused high mortalities, poor growth and thickened shells in oysters. It had no effect on adult scallops.

Descriptors: antifouling substances; pollution effects; toxicity tests; growth; heavy metals; copper compounds; tin compounds; scallop culture; oyster culture; fouling control

Taxonomic Descriptors: *Pecten maximus*; *Crassostrea gigas*

Environment: Marine

124

Species profiles: Life histories and environmental requirements of coastal fishes and invertebrates (Pacific Northwest). Chum salmon.

Pauley, G.B.; Bowers, K.L.; Thomas, G.L.

Source: BIOL. REP. U.S. FISH WILDL. SERV., 1988, 26 pp.

NTIS Order No.: PB88-210398/GAR.

Languages: English

Document Type: REVIEW; REPORT

Report No.: BIOLOGICAL-82(11 81)

Abstract: Species profiles are literature summaries of the taxonomy, morphology, range, life history, and environmental requirements of coastal aquatic species. They are designed to assist in environmental impact assessment. Chum salmon (*Oncorhynchus keta*) are anadromous fish found throughout a large part of the North Pacific Ocean and are the most widely distributed of all the Pacific salmon. Adults return to spawn in late summer and fall. Young fish migrate downstream quickly and rear in estuaries. The major commercial fishery is centered in Southeast Alaska and British Columbia. Harvest has increased in Washington to 1,150,000 fish annually due to increased hatchery production, with Hood Canal rivers accounting for 25% of all Washington fish. (Sponsored by National Wetlands Research Center, Slidell, LA, and Army Engineer Waterways Experiment Station, Vicksburg, MS (USA). Environmental Lab.)

Descriptors: life history; animal morphology; distribution records; environmental effects; habitat; literature reviews; commercial species; anadromous migrations; fish culture

Geographic Descriptors: INE, USA

Taxonomic Descriptors: *Oncorhynchus keta*

Environment: MARINE; BRACKISH; FRESH

Identifiers: taxonomy

125

Reflexions pratiques sur quelques exemples des effets potentiels de la pollution physicochimique sur la nutrition des poissons.

(Practical considerations about some examples of potential effects of physico-chemical pollution on fish nutrition.).

Peres, G.; Boge, G.

(Inst. Michel Pacha, Lab. Marit. Physiol., 1337 Corniche Michel Pacha, Tamaris, 83500 La Seune-sur-Mer, France)

Source: ICHTYOPHYSIOL. ACTA., no. 11, pp. 187-195, (1987).

Languages: French

Summary Languages: French

Document Type: Journal Article

Abstract: Examples derived from respiratory and digestive functions show that fish nutrition can be perturbed by ecopollution of physical origin (unusual variations in water temperature) or of chemical origin (abnormal discharge of products in quality or in quantity), involving thus more or less important

consequences (death, growth delay, perturbation in reproduction, etc.)
Descriptors: pollution effects; chemical pollution; thermal pollution; respiration; digestion; ecophysiology;
Pisces
Environment: Marine; Brackish; Fresh

126

Liver pathology in fishes from the lower Elbe as a consequence of pollution.

Peters, N.; Koehler, A.; Kranz, H.

(Zool. Inst. und Zool. Mus., Univ. Hamburg, Martin-Luther-King-Platz 3, D-2000 Hamburg 13, FRG)

Source: DIS. AQUAT. ORG., vol. 2, no. 2, pp. 87-97, (1987).

Languages: English

Summary Languages: English

Document Type: Journal Article

Abstract: In flounder *Platichthys flesus*, ruffe *Gymnocephalus cernua*, and smelt *Osmerus eperlanus*, caught mainly during 1980 through 1983 in the Lower Elbe, a large number of serious pathological liver conditions were diagnosed. The predominant symptom was a shrinkage of liver cells, which spreads with advancing age and is increasingly accompanied by other degenerative changes, such as dissolution of the well-organized liver structure, blood clots, and tissue necroses. Neoplastic liver nodules were found in 32% of sexually mature ruffe. Elbe flounders, which mature sexually shortly after migrating to their spawning grounds in the southern North Sea, still showed no signs of such nodules. In contrast, recent investigations of sexually mature flounders off the Dutch coast revealed occurrence rates as high as 10%. Fishes from the River Eider, in which pollution is minimal, were effectively free from such liver damage.

Descriptors: liver; histopathology; pollution effects; necroses; lesions; chlorinated hydrocarbons

Geographic Descriptors: Germany, Fed. Rep., Elbe R.; ANE, Germany, Fed. Rep., Elbe Estuary

Taxonomic Descriptors: *Platichthys flesus*; *Gymnocephalus cernua*; *Osmerus eperlanus*

Environment: Marine; Brackish

127

Oyster size, age, and copper and zinc accumulation.

Phelps, H.L.; Hetzel, E.W.

(Univ. District Columbia, 4200 Connecticut Ave., N.W., Washington, DC 20009, USA)

Source: J. Shellfish Res., vol. 6, no. 2, pp. 67-70, (1987).

Languages: English

Summary Languages: English

Document Type: Journal Article

Abstract: Copper and zinc concentrations and growth parameters were measured in two artificially spawned sets of oysters, ages one through five years, raised in the mid Chesapeake Bay. The Shadyside, MD oyster set had yearly increases in shell size and body weight and decreasing tissue concentrations of copper and zinc. The Horn Point, MD oyster set had little increase in shell size or body weight after the first year and increasing tissue concentrations of copper and zinc. The Horn Point (stunted) oysters had significantly more metal than Shadyside oysters of the same age and preferentially accumulated copper, with twice the copper-zinc ratio.

Descriptors: bioaccumulation; copper; zinc; oyster culture; growth; pollution effects

Geographic Descriptors: ANW, Chesapeake Bay

Taxonomic Descriptors: *Crassostrea virginica*

Environment: Marine

Intoxication expérimentale de la truite arc-en-ciel Salmo gairdneri Richardson par du gas-oil moteur: Modifications hématologiques histologie.

(Experimental poisoning of the rainbow trout (*Salmo gairdneri*) Richardson, by engine diesel-oil: Mortalities, haematological changes, histology).

Poirier, A.; Baudin Laurencin, B.; Bodennec, G.; Quentel, C.

(Minist. Agric., Serv. Vet., Lab. Natl. Pathol. Anim. Aquat., IFREMER, Cent. de Brest, BP 337, 29273, Brest Cedex, France)

Source: AQUACULTURE, vol. 55, no. 2, pp. 115-137, (1986).

Languages: French

Summary Languages: English; French

Document Type: Journal Article

Abstract: Rainbow trout (*Salmo gairdneri*) were kept for 96 h in diesel oil contaminated waters: 100-2500 ml/m super(3) in five trials conducted with 0.3-1-g fry and 330-8300 ml/m super(3) in two trials with 150-250-g fish. The concentrations, measured by UV spectrofluorimetry, varied widely with time and took into account transitory emulsions. Consequently, the determination of lethal concentrations was only of relative significance. CL sub(50) at 96 h would be about 100 ppm for fry. Haematological and histological studies were performed on surviving specimens. At the end of the poisoning, haemodilution, hyperglycemia lymphopaenia, as well as lesions of the gills, gastric glands and exocrine pancreas, were observed and related to a stress reaction resulting from the pollutant. Anaemia and leucopaenia were still observed a week after poisoning they may be caused by the toxic effect of hydrocarbons. The consequences of accidental pollution of a fish culture facility are discussed.

Descriptors: oil pollution; pollution effects; mortality causes; hematology; pathology; fish culture; toxicity

Taxonomic Descriptors: *Salmo gairdneri*

Environment: Fresh

Environmental implications of coastal aquaculture.; Annual Meet. 1989, Aquaculture Association of Canada Symp.; St. John's, Nfld. (Canada); 10 Jul 1989.

Prakash, A.

(AGRODEV Canada Inc., Ste. 1730, 1176 W. Georgia, Vancouver, B.C. V6E 4A2, Canada)

Source: BULL. AQUACULT. ASSOC. CAN. BULL. ASSOC. AQUAC. CAN., no. 89-3, 1989, pp. 109-111. PROCEEDINGS OF THE ANNUAL MEETING 1989, AQUACULTURE ASSOCIATION OF CANADA SYMPOSIUM.

Languages: English

Document Type: CONFERENCE; BOOK

Abstract: Since aquaculture is intimately linked with aquatic environmental quality, entry of pollutants to coastal waters constitutes the greatest threat to marine environmental quality and, hence, to long-term viability of coastal aquaculture. With the increasing tendency for intensive aquaculture in productive but confined waters, the industry in some regions may be sowing the seeds for environmental problems such as accelerated eutrophication, oxygen depletion, toxic algal blooms, disease outbreaks and massive fish kills.

Descriptors: aquaculture enterprises; pollution effects; aquaculture effluents; fish diseases; eutrophication; algal blooms; marine pollution; coastal zone

Geographic Descriptors: Canada Coasts

Environment: MARINE

130

Studies on uptake and accumulation of lead by Sarotherodon niloticus. Aquaculture International Congress and Exposition Vancouver, B.C. (Canada) 6-9 Sep 1988.

Putro, S.; Danudirgo, S.W.

(Res. Coord. Cont. Fish., Minist. Agricult., Indonesia)

Source: PROC. AQUACULT. INT. CONGR., 1988, p. 55.

AQUACULTURE INTERNATIONAL CONGRESS AND EXPOSITION, VANCOUVER TRADE AND CONVENTION CENTRE, VANCOUVER, BRITISH COLUMBIA, CANADA, SEPTEMBER 6-9, 1988.

Languages: English Summary only.

Document Type: Conference; Summary; Book

Abstract: Studies on uptake and accumulation were aimed to reveal the site for lead accumulation and the effect of organic (Pb-acetate) and inorganic (Pb-nitrate) pollutants on lead uptake and accumulation. Results showed that the highest accumulation of lead was found in the fish liver. There was also evidence that uptake and accumulation of lead in the fish organs was directly correlated with the concentration of lead salts in the surrounding water and the duration of fish exposed to these pollutants, except for liver and brain. There is a potential health hazard to consume *S. niloticus* which are cultivated in the water known to be polluted by lead.

Descriptors: bioaccumulation; lead; liver; water pollution; fish culture

Taxonomic Descriptors: *Sarotherodon niloticus*

Environment: Fresh

131

Remote sensing application to coastal shrimp culture in Bangladesh. Regional Seminar on the Application of Remote Sensing Techniques to Coastal Zone Management and Environmental Monitoring Dhaka (Bangladesh) 18-26 Nov 1986.

Quader, M.O.

(Bangladesh Space Research and Remote Sensing Organ. (SPARRSO), Mokahash Biggyan Bhaban, Argagaon, Sher-e-Bangla, Dhaka, Bangladesh; UNDP/ESCAP Reg. Remote Sensing Programme, Bangkok (Thailand))

Source: Proceedings of the regional seminar on the application of remote sensing techniques to coastal zone management and environmental monitoring (Dhaka, Bangladesh, 18-26 November 1986), (1987), pp. 336-345.

Languages: English

Document Type: CONFERENCE; BOOK

Abstract: A study was conducted to identify, locate and classify shrimp farms along the coastal areas of Bangladesh, using low altitude aerial photography, thematic map data and Landsat MSS digital data. The importance of remote sensing data in assessing the impact of shrimp culture activities on mangrove ecosystems in the region is discussed.

Descriptors: remote sensing; coastal zone; shrimp culture; environmental monitoring; environmental impact; mangrove swamps; ecosystem disturbance

Geographic Descriptors: ISW, Bangladesh

Environment: MARINE

Mangrove ecosystem study of Chakoria Sunderbans at Chittagong with special emphasis on shrimp ponds by remote sensing techniques. 17. International Liege Colloquium on Ocean Hydrodynamics Liege (Belgium) (1986).

Quader, O.; Pramanik, M.A.H.; Khan, F.A.; Polcyn, F.C.

(Bangladesh Space Res. and Remote Sens. Organ. (SPARRSO), Dhaka, Bangladesh)

Nihoul, J.C.J., ed.

Source: ELSEVIER OCEANOGR. SER., vol. 42, 1986, pp. 645-654.

MARINE INTERFACES ECOHYDRODYNAMICS.

Summary Languages: English

Document Type: Conference; Book

Report No.: ISBN 0-444-42626-4

Abstract: Mangrove ecosystem of Chakoria Sunderbans have been greatly influenced by man's activities. In order to allow for a suitable habitat for shrimp culture much of this ecosystem has been altered. The objective of this study was to identify shrimp-ponds and monitor temporal changes and their impact on the Chakoria Sunderbans mangrove Ecosystem, using aerial photography and Landsat MSS digital data. The Multitemporal Landsat MSS data were very useful in identifying changes in the mangrove Ecosystem of Chakoria Sunderbans. But the boundaries of the shrimp-ponds are not detectable in MSS data. Because of the improve ground resolution, the use of Thematic Mapper (TM) data for monitoring coastal mangrove ecosystem offers many advantages over MSS data.

Descriptors: mangrove swamps; remote sensing; shrimp culture; pond culture; man-induced effects

Geographic Descriptors: ISW, Bangladesh, Chittagong, Chakoria Sunderbans

Environment: Marine

Toxic effects of latex and Tygon tubing on marine phytoplankton, zooplankton and bacteria.

Price, N.M.; Harrison, P.J.; Landry, M.R.; Azam, F.; Hall, J.F.

(Dep. Bot., Univ. British Columbia, Vancouver, B.C. V6T 2B1, Canada)

Source: MAR. ECOL. (PROG. SER.), vol. 34, no. 1-2, pp. 41-49, (1986).

Languages: English

Summary Languages: English

Document Type: Journal Article

Abstract: Natural plankton assemblages were incubated with a small piece of silicone, Tygon or latex rubber tubing in 200 ml of culture to determine potential long-term toxic effects of the tubing. Drastic decreases in cell numbers and chlorophyll fluorescence indicated that 95% of the phytoplankton were killed by the latex rubber tubing in 4 d. bacterial numbers decreased initially, but resistant forms began to grow at the end of the experiment. New unwashed Tygon tubing significantly decreased phytoplankton growth rates. Washing Tygon tubing removed this toxic effect. Tubing effects on zooplankton survival, fecundity and egg viability were tested for the copepod *Acartia clausii*. Latex tubing had the largest effect on these parameters followed by Tygon tubing. Silicone tubing exerted no significant effect.

Descriptors: toxicity tests; silicon; rubber; tubing; phytoplankton; zooplankton; survival; fecundity; long-term records

Taxonomic Descriptors: bacteria; *Acartia clausii*

Environment: Marine

Identifiers: Tygon

134

Reversible arrest of Artemia development by cadmium.

Rafiee, P.; Matthews, C.O.; Bagshaw, J.C.; MacRae, T.H.

(Dep. Biol., Dalhousie Univ., Halifax, N.S. B3H 4J1, Canada)

Source: CAN. J. ZOOL. J. CAN. ZOOL., vol. 64, no. 8, pp. 1633-1641, (1986).

Languages: English

Summary Languages: English; French

Document Type: Journal Article

Abstract: Under normal conditions, an encysted *Artemia* embryo undergoes a developmental process that culminates in the gradual, uninterrupted emergence of the prenauplius from the cyst. The hatching membrane surrounding the emerged organism is then ruptured, usually beginning at the posterior end, and a motile nauplius is released. The authors have observed this process microscopically in the presence and absence of cadmium and report that cadmium disrupts *Artemia* development in a dose-dependent manner. At 0.1 μ M, cadmium slows emergence but nauplii eventually resume relatively normal development. Emergence and hatching are either delayed considerably or almost entirely prevented at 1 μ M cadmium. cadmium at 10 μ M, completely arrests emergence but development continues at a reduced rate, eventually resulting in hatching of some organisms without need for complete emergence.

Descriptors: pollution effects; cadmium; emergence; embryonic development

Taxonomic Descriptors: *Artemia*

Environment: Brackish

135

Aquaculture in coastal zone: Constraints and regulations.; Symp. on coastal aquaculture; Cochin (India); 12-18 Jan 1980.

Rajyalakshmi, T.

(Cent. Inland Fish. Res. Inst., Barrackpore, India)

Source: SYMP. SER. MAR. BIOL. ASSOC. INDIA, 1986, no. 6, pp. 1344-1351.

PROCEEDINGS OF THE SYMPOSIUM ON COASTAL AQUACULTURE, HELD AT COCHIN, FROM JANUARY 12 TO 18, 1980. PART 4: CULTURE OF OTHER ORGANISMS, ENVIRONMENTAL STUDIES, TRAINING, EXTENSION AND LEGAL ASPECTS.

Languages: English

Document Type: CONFERENCE; BOOK

Abstract: This paper examines the constraints and benefits of aquaculture in the coastal zone. The various constraints that deter the rational development of aquaculture in the coastal zone include legal and riparian rights, effluent regulations, oil and energy developments besides the territorial zone regulations. Recent developments in regard to the 200 mile Economic Zone off India's Coastal Zone, have also an impact on the coastal aquaculture. It is proposed that a national policy on aquaculture be recommended, the guidelines for which must be formulated on the basis of investigations suggested in the present paper and more detailed case studies.

Descriptors: marine aquaculture; aquaculture development; aquaculture regulations; coastal waters

Geographic Descriptors: ISW, India

Environment: MARINE

136

Long-term effect of ammonium sulfate fertilizer on histophysiology of adrenal in the teleost, Channa punctatus (Bloch).

Ram, R.N.; Singh, S.K.

Source: Bulletin of environmental contamination and toxicology. New York, N.Y.: Springer-Verlag. Dec 1988,

v. 41 (6), p. 880-887, ill.

Languages: English

Report No.: ISSN 0007-4861

DNAL Call No.: RA1270.P35A1

137

Toxic effects of DDT, malathion and mercury on the tissue carbohydrate metabolism of Sarotherodon mossambicus (Peters).

Ramalingam, K.

(Dep. Zool., Gov. Arts Coll., Nandanam, Madras 600 035, India)

Source: PROC. INDIAN ACAD. SCI. (ANIM. SCI.), vol. 97, no. 5, pp. 443-448, (1988).

Languages: English

Summary Languages: English

Document Type: JOURNAL ARTICLE

Abstract: Toxic stress due to DDT, malathion and mercury on the tissue carbohydrate metabolism of *Sarotherodon mossambicus* revealed the following manifest effects: concentration of free sugars in the liver and muscle increased due to mobilisation of it from its bound form, glycogen and the normal carbohydrate metabolic pathway was altered indicating a switch over to anaerobic state involving the conversion of sugars into more lactate via pyruvate.

Descriptors: DDT; mercury; pesticides; fish physiology; pollution effects; carbohydrates

Taxonomic Descriptors: *Sarotherodon mossambicus*

Environment: FRESH

Identifiers: malathion

138

Effects of chromium and cadmium upon respiration and survival of Callinectes similis

Ramirez, P.; Barrera, G.; Rosas, C.

(Universidad Autonoma Metropolitana Iztapalapa, Mexico, D.F.)

Source: Bulletin of environmental contamination and toxicology. New York, N.Y.: Springer-Verlag. Dec 1989, v. 43 (6), p. 850-857.

Languages: English

Report No.: ISSN 0007-4861

DNAL Call No.: RA1270.P35A1

139

Case reports of diseases of some marine teleosts, in and around Visakhapatnam Harbour.

Rao, K.S.; Rani, K.U.; Rao, K.V.S.J.; Rao, D.M.

(Dep. Zool., Andhra Univ., Waltair, India)

Source: SYMP. SER. MAR. BIOL. ASSOC. INDIA., no. 6, 1985, pp. 824-827.

Symp. on coastal aquaculture Cochin (India) 12-18 Jan 1980. Proceedings of the symposium on coastal aquaculture held at Cochin from January 12 to 18, 1980. Part 3: Finfish Culture.

Languages: English

Summary Languages: English

Document Type: Conference; Book

Abstract: Abnormalities in some fishes were observed in the Visakhapatnam Harbour area. In some specimens of *Elops saurus*, low total RBC count, reduced haemoglobin content and change in the ratio of total WBC

to RBC count from the normal 0.081 to 0.189 indicated anaemia. In both *E. saurus* and *Gerres filamentosus* high percentage of immature cells was also observed associated with anaemia in the former and physiological stress in the latter. Gonadal infection by the microsporidian *Nosema* sp. was observed in the case of *Nemipterus mesoprion* obtained from trawl catches. Gonadal tumours were observed in 10 of 190 specimens examined. Epidermal tumours were observed in the head region of a marine teleost *Johnius* (*Johnieops*) *aneus*. Physico-chemical and biological agents related to industrial and domestic wastes discharged into Visakhapatnam Harbour may be a possible cause for the diseases warranting consideration in the location of fish farms for coastal aquaculture.

Descriptors: marine fish; infectious diseases; histopathology; fish culture; industrial wastes; domestic wastes; pollution effects

Geographic Descriptors: ISW, India, Visakhapatnam

Taxonomic Descriptors: Teleostei

Environment: Marine

140

Incidence du debit de la Charente sur la capacite biotique du bassin ostreicole de Marenne-Oleron.

(Effect of the flow from the Charente river on the biotic capacity of the oyster beds in the Marennes-Oleron basin).

Ravail, B.; Heral, M.; Maestrini, S.; Robert, J.M.

(Cent. Rech. Ecol. Mar. Aquacult., Case 5, l'Houmeau, 17137 Nieul-sur-mer, France)

Source: J. RECH. OCEANOGR., (1988), vol. 13, no. 1-2, pp. 48-52.

Languages: French; English

Document Type: JOURNAL ARTICLE

Abstract: The Charente Estuary can be considered as a vast natural zone of brackish waters mixing with the marine waters of Marennes-Oleron. Part of the campaigns from October 1985 to November 1987, defined the main hydrobiological features of the estuary and estimated the input of the Charente River.

Observations established the general hydrobiological pattern of the estuarine bay and showed that the Charente River plays role in the marine waters.

Descriptors: basins; biotic factors; conchology; oyster culture; river discharge; dissolved organic matter

Geographic Descriptors: ANE, France, Poitou-Charentes, Marennes-Orlean Bay; ANE, France, Charente Estuary; France, Charente R.

Environment: MARINE

141

Copper, zinc, cadmium, and lead in scallops (Placopecten magellanicus) from the Maritimes.

Ray, S.; Jerome, V.

(Department of Fisheries and Oceans, St. Andrews, N.B. (Canada). Biol. Stn.)

Source: CAN. TECH. REP. FISH. AQUAT. SCI., no. 1519, 1987, 32 pp.

Languages: English

Summary Languages: English; French

Document Type: Report

Report No.: ISSN 0706-6457

Abstract: Scallops (*Placopecten magellanicus*) collected from 19 sites of commercial importance in the Maritimes were analyzed for Cu, Zn, Cd and Pb in adductor muscle, mantle, gill and viscera.

Concentrations of all metals were in the order, muscle mantle gill viscera, with a few exceptions. Cu and Zn levels in all scallops from the study area were comparable to those from the control site near St. Andrews. Levels of Cd and Pb in scallops from Chaleur Bay and Cd in those from Northumberland Strait, Bay of Fundy and the offshore sites were much higher than in the controls. scallops collected from specific

sites in Chaleur Bay, known to have anthropogenic input, had still higher levels of Cd and Pb. The very high concentrations of Cd in scallops from Georges Bank and still higher in those from Browns Bank, far away from any source of anthropogenic input, suggest a natural source for the metal.

Descriptors: heavy metals; pollution effects; scallop culture; marine pollution

Geographic Descriptors: ANW, Canada, Maritime Provinces

Taxonomic Descriptors: *Placopecten magellanicus*

Environment: Marine

142

Perkinsus marinus: Distribution in Atlantic and Gulf coast oyster populations with suggested control methods.

Ray, S.M.; Anderson, D.E.

(Mar. Biol. Dep., Texas A&M Univ., Galveston, TX, USA)

Source: J. Shellfish Res., vol. 7, no. 3, p. 544, (1988). 1989 Annu. Meet. of the National Shellfisheries Association Los Angeles, CA (USA) 12 Feb 1989.

Languages: English

Document Type: CONFERENCE; SUMMARY; JOURNAL ARTICLE

Abstract: Recent surveys show that *Perkinsus* (*Dermocystidium*) *marinus* is widely distributed in oyster (*Crassostrea virginica*) populations on the Atlantic coast from Chesapeake Bay to Georgia and on the Gulf coast from the Florida Everglades to Brownsville, Texas. *Perkinsus* causes significant oyster mortality during the warm months in areas where the water salinities consistently exceed 20 ppt. The moderating effect of low winter temperatures, which provides some protection for Chesapeake oysters from *Perkinsus* disease, does not prevail in the Gulf. For this reason, the strategies for developing control measures for reducing this oyster disease on the Gulf coast will be different and more difficult than those applicable to the Chesapeake Bay. Currently employed and potential measures for reducing *Perkinsus* disease in Gulf and Atlantic oyster populations are discussed.

Descriptors: parasitic diseases; epidemiology; disease control

Geographic Descriptors: ANW, USA; ASW, Mexico Gulf

Taxonomic Descriptors: *Crassostrea virginica*

Environment: MARINE

Identifiers: *Perkinsus marinus*

143

Ecology of algae in the paper mill effluents and their impact on the river Tungabhadra.

Reddy, P.M.; Venkateswarlu, V.

Source: Journal of environmental biology. Muzaffarnagar, India: K. Dalela. Oct. 1986, v. 7 (4), p. 215-223.

Languages: English

Report No.: ISSN 0254-8704

DNAL Call No.: QH540.J65

144

Pollution due to coir retting and its effect on estuarine flora and fauna.

Remani, K.N.; Nirmala, E.; Nair, S.R.

(Centre for Water Resources Development and Management, Kunnamangalam, Kerala, India)

Source: International journal of environmental studies. London: Gordon and Breach Science Publishers. 1988, v. 32 (4), p. 285-295, maps.

Languages: English

145

Bioconcentration of chlorophenols by juvenile chinook salmon (Oncorhynchus tshawytscha) overwintering in the upper Fraser River: Field and laboratory tests.

Rogers, I.H.; Servizi, J.A.; Levings, C.D.

(Phys. and Chem. Sci. Branch, Dep. Fish. and Oceans, West Vancouver Lab., 4160 Marine Dr., West Vancouver, B.C. V7V 1N6, Canada)

Source: WATER POLLUT. RES. J. CAN., vol. 23, no. 1, pp. 100-113, (1988).

Languages: English

Summary Languages: English

Document Type: Journal Article

Abstract: Juvenile chinook salmon (*Oncorhynchus tshawytscha*) were sampled from Aug 1986 to Mar 1987 at stations near Prince George and Quesnel, influenced by sewage and pulp mill discharges. Chlorophenol uptake in feral fish was low. However, 3,4,5-trichloroguaiacol levels to 304 ng/g and tetrachloroguaiacol values to 136 ng/g were measured in Mar. Fish from Agassiz, 518 km downstream of Quesnel, also contained these two substances. Thus chinook salmon can bioconcentrate persistent chlorophenols and chloroguaiacols directly from cold water (1 degree C). The biological consequences are uncertain.

Descriptors: chemical pollution; pulp wastes; chlorine compounds; phenols; fingerlings; sewage; bioaccumulation; water temperature; pollution effects

Geographic Descriptors: Canada, British Columbia, Fraser R.

Taxonomic Descriptors: *Oncorhynchus tshawytscha*

Environment: Fresh

146

The effects of sodium cyanide on coral reefs and marine fish in the Philippines. 1. Asian Fisheries Forum Manila (Philippines) 26 May 1986.

Rubec, P.J.

(Int. Marinelife Alliance, 314 Lincoln St., Suite 645, Hingham, MA 02043, USA)

Maclean, J.L.; Dizon, L.B.; Hosillos, L.V., eds.

Source: THE FIRST ASIAN FISHERIES FORUM. PROCEEDINGS OF THE FIRST ASIAN FISHERIES FORUM (MANILA, PHILIPPINES, 26-31 MAY 1986), 1986, pp. 297-302.

Languages: English

Summary Languages: English

Document Type: Conference; Book

Report No.: ISBN 971-1022-27-3

Abstract: Sodium cyanide (NaCN) has been in use by tropical marine fish collectors in the Philippines since 1962. This paper reviews the many detrimental toxic effects of cyanide on fish which were published in the pet hobby and scientific literature. Interviews with scientists, fish collectors and aquarium industry personnel confirmed that NaCN is contributing to the destruction of Philippine coral reefs and the decline of aquarium and food fishes. About 71% of Philippine reefs are in poor to fair condition due to excessive siltation due to deforestation and the widespread use of NaCN and explosives by fishermen. There is a high mortality of fish squirted with NaCN on the reef and delayed mortalities throughout the chain of middlemen to the marine hobbyist. It is postulated that the "Sudden Death Syndrome" observed in aquaria is due to the conversion of thiocyanate in the blood back to hydrocyanic acid when the fish receives a mild stress. A program to train divers in the use of fine-mesh nets has been initiated to replace the use of NaCN. A pilot project in 1984 has demonstrated that nets can benefit the coral reefs, the collectors and the marine

aquarium industry.

Descriptors: fish poisoning; cyanides; tropical fish; coral reefs; toxicity

Geographic Descriptors: ISEW, Philippines

Environment: Marine

147

Effects of fish farming on growth and chlorophyll a content of Cladophora.

Ruokolahiti, C.

(Dep. Biol., Aabo Akademi, SF-20500 Aabo, Finland)

Source: MAR. POLLUT. BULL., vol. 19, no. 4, pp. 166-169, (1988).

Languages: English

Summary Languages: English

Document Type: Journal Article

Abstract: Variations in biomass, length and chlorophyll content of the green alga *Cladophora glomerata* were measured near fish farms in SW Aaland, N. Baltic Sea. The highest biomasses and the tallest *Cladophora* tufts were found in August at localities close to the farms. The same localities showed the shortest tufts and the highest chlorophyll a contents in September-October.

Descriptors: fish culture; chlorophylls; biomass; nutrients (mineral)

Geographic Descriptors: ANE, Baltic

Taxonomic Descriptors: *Cladophora glomerata*

Environment: Marine

148

Acute toxicity and behavioral effects of acrylates and methacrylates to juvenile fathead minnows.

Russom, C.L.; Drummond, R.A.; Hoffman, A.D.

Source: Bulletin of environmental contamination and toxicology. New York, N.Y.: Springer-Verlag. Oct 1988, v. 41 (4), p. 589-596.

Languages: English

Report No.: ISSN 0007-4861

DNAL Call No.: RA1270.P35A1

149

A review of the occurrence and persistence of enteroviruses in the marine environment; 1988 Annu. Meet. of the Natl. Shellfisheries Assoc.; New Orleans, LA (USA); 26 Jun 1988.

Sample, J.D.

(NMFS, Charleston, SC 29412, USA)

Source: J. Shellfish Res., vol. 7, no. 1, p. 200, (1988).

Languages: English Summary only.

Document Type: CONFERENCE; SUMMARY; JOURNAL ARTICLE

Abstract: Viruses may be transported to shellfish and their natural growing waters by numerous routes.

Domestic sewage is the main route into the marine environment. Many viruses survive secondary sewage treatment and chlorination leaving significant numbers of infectious viruses that may reach the marine environment by either direct discharge of treated or untreated sewage effluents. Additional routes of transportation include ocean dumping, aerosols, runoff, septic tanks and pipe leakage, groundwater and others. After viruses are released into the coastal waters, they may remain suspended in seawater and be transported to recreational areas or accumulate in bottom sediments or bioconcentrate in filter-feeding

shellfish.

Descriptors: shellfish culture; water quality; microbial contamination; pollution effects; marine pollution; public health; pollution control

Taxonomic Descriptors: viruses

Environment: MARINE

150

Effects of a bleached pulp mill effluent on growth and gonad function in Baltic coastal fish.

Sandstrom, O.; Neuman, E.; Karas, P.

Source: Water science and technology: A journal of the International Association on Water pollution Research. Oxford: Pergamon Press. 1988, v. 20 (2), p. 107-118, maps.

Languages: English

Report No.: ISSN 0273-1223

DNAL Call No.: TD420.A1P7

151

Bioconcentration of chlorophenols by early life stages of Fraser River pink and chinook salmon (Oncorhynchus gorbuscha, O. tshawytscha).

Servizi, J.A.; Gordon, R.W.; Carey, J.H.

(Biol. Sci. Branch, Cultus Lake salmon Res. Lab., Dep. Fish. and Oceans, Cultus Lake, B.C. V0X 1H0, Canada)

Source: WATER POLLUT. RES. J. CAN., vol. 23, no. 1, pp. 88-99, (1988).

Languages: English

Summary Languages: English

Document Type: Journal Article

Abstract: Chlorophenol content of emergent pink salmon (*Oncorhynchus gorbuscha*) fry from five natal spawning grounds and fingerling chinook (*Oncorhynchus tshawytscha*) from the Fraser River was determined. Major chlorophenols identified were pentachlorophenol, 2,3,4,6-tetrachlorophenol, 2,4,6-trichlorophenol and 2,4-dichlorophenol. Sources of these compounds appear to be lumber mills using chlorophenol based fungicides and pulp and paper mill effluents. Chlorophenol content was greatest in pink salmon fry from the Thompson River (58.4 mg/g total chlorophenols). Fingerling chinook from the Fraser River contained 37.7 ng/g total chlorophenols. The 96-hr LC sub(50) of Woodbrite 24, a chlorophenol based fungicide to pink salmon during the egg-to-fry stage was determined to be in the 100 to 150 ug/l range. This range is about 100 times higher than average levels reported for Fraser River water.

Descriptors: chemical pollution; pulp wastes; chlorine compounds; phenols; fungicides; developmental stages; fingerlings; fry; bioaccumulation; pollution effects

Geographic Descriptors: Canada, British Columbia, Fraser R.

Taxonomic Descriptors: *Oncorhynchus gorbuscha*; *Oncorhynchus tshawytscha*

Environment: Fresh

152

The application of remote sensing techniques to study the relationship between the shrimp/fish farms and the mangrove ecosystem of the Bangladesh coastal region. Regional Seminar on the Application of remote sensing Techniques to coastal zone management and Environmental Monitoring Dhaka (Bangladesh) 18-26 Nov 1986.

Shahid, M.A.; Pramanik, M.A.H.

(Bangladesh Space Res. and Remote Sens. Organ. (SPARRSO), Mohakash Biggyan Bhaban, Argagaon,

Sher-e-Bangla Nagar, Dhaka, Bangladesh)
 (UNDP/ESCAP Reg. remote sensing Programme, Bangkok (Thailand) Bangladesh Space Research and remote sensing Organ., Dhaka (Bangladesh))
Source: Proceedings of the regional seminar on the application of remote sensing techniques to coastal zone management and environmental monitoring, Dhaka, Bangladesh, 18-26 November 1986, (1987), pp. 108-119.
Languages: English
Document Type: CONFERENCE; BOOK
Abstract: The results are presented of a study conducted using remote sensing to identify and locate the extent of shrimp/fish farms and mangrove forests in the Maiskhali and Chakaria Sunderbans region of Bangladesh. Available data were also analyzed to determine the relationship between the fish farms and the mangrove ecosystem.
Descriptors: remote sensing; coastal zone; environmental monitoring; shrimp culture; environmental impact; mangrove swamps; ecosystem disturbance
Geographic Descriptors: ISW, Bangladesh
Environment: MARINE

153

Effect of effluent from a chlor-alkali factory on nitrogen fixation ability of Westiellopsis prolifica.
 Shaw, B.P.; Sahu, A.; Panigrahi, A.K.
 (Berhampur University, Berhampur, Orissa, India)
Source: Microbios letters. Cambridge: Faculty Press. 1989, v. 42 (166), p. 91-96.
Languages: English
Report No.: ISSN 0307-5494
DNAL Call No.: QR1.M49

154

Species profiles: Life histories and environmental requirements of coastal fishes and invertebrates (Pacific Southwest). California Sea mussel and Bay mussel.
 Shaw, W.N.; Hassler, T.J.; Moran, D.P.
Source: BIOL. REP. U.S. FISH WILDL. SERV., 1988, 25 pp.
NTIS Order No.: PB89-124721/GAR.
Languages: English
Document Type: REVIEW; REPORT
Report No.: BIOLOGICAL-82(11 84)
Abstract: Species profiles are literature summaries of the taxonomy, morphology, distribution, life history, and environmental requirements of coastal aquatic species. They are prepared to assist in environmental impact assessment. The California sea mussel, *Mytilus californianus* and the bay mussel, *M. edulis*, are commonly collected for bait. The eggs of both species develop into a trochophore stage in 12-24 hours after fertilization, and the planktonic larval stage lasts 3-4 weeks. Sexual maturity can occur in one year. Spawning of the sea mussel occurs sporadically throughout the year; the bay mussel spawns in central California in late fall and winter. (Prepared in cooperation with Humboldt State Univ., Trinidad, CA. Fred Telonicher Marine Lab. Sponsored by Army Engineer Waterways Experiment Station, Vicksburg, MS.)
Descriptors: life history; animal morphology; distribution records; environmental effects; habitat; literature reviews; environmental impact; spawning; bait fishing; mussel fisheries
Geographic Descriptors: INE, USA
Taxonomic Descriptors: *Mytilus californianus*; *Mytilus edulis*
Environment: MARINE

Identifiers: taxonomy

155

Jizhong zhongjinshu lizi dui houqiao yibei peitai fayu yingxiang de chubu yanjiu.

(A preliminary study of influences of several heavy metal ions on the development of early embryo of thick shell mussel (*Mytilus coruscus* Gould)).

Shi, J.-X.; Yu, J.-L.

(2nd Inst. Oceanogr., SOA, Hangzhou, People's Rep. China)

Source: DONGHAI MAR. SCI. DONGHAI HAIYANG., vol. 4, no. 1, pp. 46-50, (1986).

Languages: Chinese

Summary Languages: English

Document Type: Journal Article

Abstract: The influence of various concentrations of 4 heavy metal ions on the fertilization and development of the early embryo of the thick shell mussel (*Mytilus coruscus*) is described. The results obtained show that when the concentration of Pb super(2+) or Cd super(2+) is below 2ppm, no obvious influence occurs, but in the case of Cu super(2+) or Hg super(2+), the concentration of only 20ppb has a serious influence on the incubation of fertilized eggs. Environmental conditions are very important in the artificial culture of shell fish.

Descriptors: embryonic development; heavy metals; biological fertilization; pollution effects

Taxonomic Descriptors: *Mytilus coruscus*

156

Accumulation of butyltins in muscle tissue of chinook salmon reared in sea pens treated with tri-n-butyltin.

organotin Symposium (at) Oceans '86 "Science-Engineering-Adventure" Washington, DC (USA) 23-25 Sept. 1986.

Short, J.W.; Thrower, F.P.

(Northwest and Alaska Fish. Cent., Auke Bay Lab., NMFS, NOAA, P.O. Box 210155, Auke Bay, AK 99821, USA)

Source: OCEANS '86, 1986, pp. 1177-1181.

OCEANS '86 CONFERENCE RECORD: SCIENCE-ENGINEERING-ADVENTURE. VOL. 4.

ORGANOTIN SYMPOSIUM.

Languages: English

Document Type: Conference; Book

Report No.: IEEE-86CH2363-0

Abstract: Muscle tissue of chinook salmon, *Oncorhynchus tshawytscha*, reared for 3 to 9 months in sea pens treated with an antifouling biocide, tri-n-butyltin (TBT), contained organotin concentrations of 0.28-0.90 $\mu\text{g/g}$ (as TBT). organotins are present in some pen-reared salmon sold in the United States: Eleven of 15 salmon advertised as aquaculture products and purchased from public markets contained organotin concentrations of 0.081-0.20 $\mu\text{g/g}$. Preliminary analyses by GCAA indicate that these organotin concentrations are TBT. Most common cooking practices do not effectively destroy or remove butyltins from salmon muscle tissue. This is to be believed that the first evidence of entry of organotins into the human diet in the United States.

Descriptors: organometallic compounds; tin compounds; bioaccumulation; cage culture; antifouling substances

Taxonomic Descriptors: *Oncorhynchus tshawytscha*

Environment: Marine

Identifiers: butyltin

157

Effect of speciation on uptake and toxicity of cadmium to shrimp Crangon Crangon (L.).

Simoes Goncalves, M.L.S.; Vilhena, M.F.C.; Machado, L.M.V.F.; Pescada, C.M.R.; Legrand de Moura, M.
(Technical University of Lisbon, Portugal)

Source: Bulletin of environmental contamination and toxicology. New York, N.Y.: Springer-Verlag. Aug. 1989, v. 43 (2), p. 287-294.

Languages: English

Report No.: ISSN 0007-4861

DNAL Call No.: RA1270.P35A1

158

Contamination of New England's fish and shellfish a report to the governors and the public: A report of the Coast Alliance.

Simon, Anne W.; Hauge, Paul.

Source: Coast Alliance (U.S.), Washington, D.C., 1987, 15 leaves.

Languages: English

DNAL Call No.: SH174.S5

159

Strategies for reducing risks from introductions of aquatic organisms: A marine perspective.

Sindermann, C.J.

(Univ. Miami's Rosenstiel Sch. Mar. and Atmos. Sci., 4600 Rickenbacker Causeway, Miami, FL 33149-1098, USA)

Source: FISHERIES, vol. 11, no. 2, pp. 10-15, (1986).

Languages: English

Document Type: Journal Article

Abstract: Transfers and introductions of marine species have occurred and are occurring on a worldwide basis, largely in response to perceived needs of expanding aquaculture industries. A major concern is the introduction of diseases not presently endemic in an area or hydrographic zone. Recent word wide transfer of a virus pathogen of penaeid shrimps is an excellent example. Negative ecological impacts of introductions of seaweeds have already been seen in the coastal waters of several countries. Because of the virtual irreversibility of successful introductions to marine waters, the problem is particularly acute, and calls for concerted international response. Some strategies to reduce risks from deliberate introductions include the development of governmental awareness of the potential effects of such actions the establishment of regional and even international committees to discuss problems related to introductions and to develop mutually acceptable procedures and the inclusion of considerations of introductions of the agendas of international regulatory bodies concerned with living resources.

Descriptors: introduced species; risks; marine environment; disease control; environmental impact

Environment: Marine

160

Summary of results from the Swedish project 'Environment/Cellulose'.

Sodergren, A.; Bengtsson, B.E.; Jonsson, P.; Lagergren, S.; Larson, A.; Olsson, M.; Renberg, L.

Source: Water science and technology: A journal of the International Association on Water Pollution Research. Oxford: Pergamon Press. v. 20 (1), p. 49-60, maps.

Languages: English

161

Oil and oyster industry conflicts in coastal Louisiana.

Soniat, T.M.

(Dep. Biol. Sci., Univ. New Orleans, New Orleans, LA 70148, USA)

Source: J. Shellfish Res., vol. 7, no. 1, p. 213, (1988). 1988 Annu. Meet. of the Natl. Shellfisheries Assoc.; New Orleans, LA (USA); 26 Jun 1988.

Languages: English

Document Type: CONFERENCE; SUMMARY; JOURNAL ARTICLE

Abstract: The juxtaposition of the oil and oyster industries in coastal Louisiana has led to inevitable conflicts. Chief among these problems are the sedimentation and burial of oysters due to dredging and other operations. (oil spills are relatively rare events). A system of compensation has evolved in which oystermen, who lease the waterbottoms from the State of Louisiana, are paid for damages due to oil and gas activities. Methodologies for the assessment of damage, the rights of oystermen in relation to the oil industry, and major legal issues are reviewed.

Descriptors: oyster fisheries; oil and gas industry; disputes; environmental impact

Geographic Descriptors: ASW, USA, Louisiana

Taxonomic Descriptors: Crassostrea virginica

Environment: MARINE

162

Oil and oyster industry conflicts in coastal Louisiana.

Soniat, T.M.

(Dep. Biol. Sci., Univ. New Orleans, New Orleans, LA 70148, USA)

Source: J. Shellfish Res., vol. 7, no. 3, pp. 511-514 (1988). Louisiana Oyster Industry Symp. 80. Annu. Meet. of the National Shellfisheries Assoc.; New Orleans, LA (USA); 26 Jun 1988.

Languages: English

Document Type: CONFERENCE; JOURNAL ARTICLE

Abstract: The juxtaposition of the oil and oyster industries in coastal Louisiana has led to inevitable conflicts. Chief among these problems are the sedimentation and burial of oysters due to dredging or other operations. (oil spills are relatively rare events.) Methodologies for the assessment of damage include "before-and-after" surveys which evaluate oyster mortality and habitat alteration. A system of compensation has evolved in which oystermen, who lease the waterbottoms from the state of Louisiana, are paid for damages due to oil and gas activities. In a recent Louisiana Supreme court case, the court discarded the established negligence standard and adopted a strict liability approach. The established negligence standard held that the mineral lessee is not liable to an oyster lessee for damage resulting from necessary and prudent operations conducted with reasonable skill and precaution, whereas the strict liability approach has made the mineral lessee liable for any operations which damage oyster property.

Descriptors: oil and gas industry; environmental impact; oyster fisheries; conflicts

Geographic Descriptors: ASW, USA, Louisiana

Taxonomic Descriptors: Crassostrea virginica

Environment: MARINE

163

Factors influencing the design of effluent quality control facilities for commercial aquaculture. Aquaculture International Congress and Exposition Vancouver, B.C. (Canada) 6-9 Sep 1988.

Stechey, D.

(Canadian Aquaculture Systems, 1395 Victoria Ave., Windsor, Ont. N8X 1N9, Canada)

Source: PROC. AQUACULT. INT. CONGR., 1988, p. 54.

AQUACULTURE INTERNATIONAL CONGRESS AND EXPOSITION, VANCOUVER TRADE AND CONVENTION CENTRE, VANCOUVER, BRITISH COLUMBIA, CANADA, SEPTEMBER 6-9, 1988.

Languages: English

Document Type: Conference; Summary; Book

Abstract: The discharge of particulate matter from aquaculture operations presents a serious pollution problem. An effective means of reducing the solids content of discharge effluent is, therefore, necessary. However, the high volumetric flow rate and the relatively dilute concentration of pollutants in the effluent impose a unique constraint on aquacultural wastewater treatment. Treatment facilities must be efficient, yet they must also be economically feasible to install and operate. The key criterion in designing sedimentation units for aquaculture effluents is an analysis of the nature and characteristics of the wastewater. This paper presents an overview of these principles and concepts.

Descriptors: aquaculture effluents; water quality control; particulates; aquaculture techniques; wastewater treatment

Environment: Fresh

164

Effect of the solvent acetone on membrane integrity in the green alga Chlorella pyrenoidosa.

Stratton, G.W.

(Nova Scotia Agricultural College, Truro, Nova Scotia, Canada)

Source: Bulletin of environmental contamination and toxicology. New York, N.Y.: Springer-Verlag. May 1989, v. 42 (5), p. 754-760.

Languages: English

Report No.: ISSN 0007-4861

DNAL Call No.: RA1270.P35A1

165

Effect of oil and dispersants on the growth of mussels.

Stroemgren, T.

(Univ. Trondheim, The Museum, Erling Skakkesgt, 47A, N-7000 Trondheim, Norway)

Source: MAR. ENVIRON. RES., (1987), vol. 21, no. 4, pp. 239-246.

Languages: English

Document Type: Journal Article

Abstract: Mussels (*Mytilus edulis* L.) were exposed to North Sea crude oil, microencapsulated oil and dispersants, singly and in combination, and growth rates measured at 24-48 h intervals. Exposure to microencapsulated pure oil (2 multiplied by 0-2 multiplied by 1 mg/litre) and to microencapsulated mixtures of oil (2 multiplied by 2-2 multiplied by 5 mg/litre) + 5% of the different dispersants (FINASOLOS 5, COREXIT 9527, DISPOLENE 36 S) gave approximately the same reduction in growth rate (80-90%) within 170 h. mussels exposed for 170 h to microencapsulated oil and to microencapsulated oil/dispersant mixtures recovered to control growth within 300 h in clean seawater, while in those given pure oil-in-water suspension, the recovery was slower. The toxicity of oil is mainly related to size and concentration of oil particles, while the effect of 5% dispersants added is negligible.

Descriptors: growth; pollution effects; oil pollution; dispersants; toxicity tolerance; crude oil

Taxonomic Descriptors: *Mytilus edulis*

Environment: Marine

166

Growth and mortality of Mytilus edulis in the coastal waters of British Columbia.

Swarbrick, S.L.; Heritage, G.D.; Jamieson, G.S.

(Mar. Sci. Inst., Univ. California, Santa Barbara, CA 93106, USA)

Source: J. Shellfish Res., vol. 7, no. 1, p. 177, (1988). 1987 Annu. Meet. of the Natl. Shellfisheries Assoc.; Halifax, N.S. (Canada); 9 Aug 1987.

Languages: English

Document Type: CONFERENCE; SUMMARY; JOURNAL ARTICLE

Abstract: Subtidal populations of the blue mussel, *Mytilus edulis*, were studied at 3 sites in the coastal waters surrounding Vancouver Island, British Columbia. A reciprocal transplant experiment was conducted to investigate the influence of both the environment (grow-out site) and potential genetic differences among *M. edulis* populations (seed source) on mortality and growth. mussels 25-45 mm in length were collected from each site and transported to the other 2 sites where they were grown alongside mussels from the endemic population. Both grow-out site and seed source had significant effects on survival. mussels grown at the northern site had the highest rate of survival while the mussel seed that survived best was collected from the west coast site. Highest mortality rates occurred in the latter half of the summer. Grow-out site and seed source also had significant effects on growth rates.

Descriptors: growth; mortality; mussel culture; environmental conditions

Geographic Descriptors: INE, Canada, British Columbia, Vancouver I.

Taxonomic Descriptors: *Mytilus edulis*

Environment: MARINE

167

Culture and toxicity tests using Los Angeles District bioassay animals, Acanthomysis and Neanthes.

Tatem, H.E.; Portzer, A.S.

(Army Engineer Waterways Experiment Stn., Vicksburg, MS (USA). Environ. Lab)

Source: MISC. PAP. U.S. ARMY ENG. WATERWAYS EXP. STN., 1985, 24 pp. (NTIS Order No.: AD-A165 468/0/GAR.)

Languages: English

Document Type: Report

Report No.: WES/MP/EL-85-6

Abstract: This study describes culture techniques and results of toxicant bioassays using the California mysid, *Acanthomysis sculpta*, the polychaete, *Neanthes arenaceodentata*, and the Gulf Coast mysid, *Mysidopsis bahia*. The mysids were tested with three toxicants: dodecyl sodium sulfate (DSS), also known as sodium laurel sulfate mercury (Hg) and PCB. The LC50 value at 72 hr for DSS showed the California mysid (0.96 ppm) more sensitive to this standard toxicant than the Gulf Coast mysid (3.80 ppm). Results of the Hg bioassays indicated that the California mysid was more tolerant of Hg than the Gulf Coast mysid. It appears that the California mysid, in comparison to the Gulf Coast mysid, was more sensitive to DSS, but less sensitive to Hg. Results from PCB (Aroclor 1254) bioassays showed relatively little difference between species (*A. sculpta* - 12.5 ppb *M. bahia* - 14.2 ppb - LC50 at 72 hr). *Neanthes arenaceodentata* were held in the laboratory according to established procedures and exposed only to only one toxicant, DSS. In comparison to the mysids, the polychaete (8.0 ppm - LC50 at 72 hr) was not as sensitive to DSS. The Section 103 Implementation Manual recommends the Gulf Coast mysid as an internal standard for dredged material bioassays. Both the California mysid and the polychaete are acceptable bioassay animals.

Descriptors: toxicity tests; PCB; heavy metals; dredge spoil; shrimp culture; worm culture; bioassays; toxicants; pollution effects; aquaculture techniques
Taxonomic Descriptors: *Acanthomysis sculpta*; *Neanthes arenaceodentata*; *Mysidopsis bahia*
Environment: Marine

168

Effects of intense mussel culture on food chain patterns and production in coastal Galicia, NW Spain.

Tenore, K.R.; Corral, J.; Gonzalez, N.; Lopez-Jamar, E.

(Skidaway Inst. Oceanogr., Savannah, GA 31416, USA)

Labish Chao, N.; Kirby-Smith, W., eds.

Source: Proceedings of the Int. Symposium on utilization of coastal ecosystems: Planning, pollution, and productivity. 1985, vol. 1, pp. 321-328.

Int. Symp. on Utilization of Coastal Ecosystems: Planning, pollution, and Productivity, Rio Grande, RS (Brazil); 21 Nov 1982.

Languages: English

Document Type: CONFERENCE; BOOK

Report No.: ISBN 85-85042-07-9

Abstract: The major effects of the intensive raft culture of the edible mussel, *Mytilus edulis*, in the bays of NW Spain is reviewed. The mussel is the major herbivore in the bays and, as the "key industry species", affects ecosystem structure and function. The presence of the mussel culture has changed the patterns of plankton composition and production. The infaunal benthic community in the Ria de Arosa is low because of the heavy organic enrichment from fecal production by the mussels. However, the organic particulates move out onto the shelf and support an enriched benthic community that may provide a significant food resource to demersal fishes.

Descriptors: marine aquaculture; mussel culture; food chains; biological production; environmental impact

Geographic Descriptors: ANE, Spain, Galicia

Taxonomic Descriptors: *Mytilus edulis*

Environment: MARINE

169

Contaminated sediments in the Elbe estuary: ecological and economic problems for the Port of Hamburg.

Tent, L., R. Thomas, R. Evans, A. Hamilton, M. Munawar, T. Reynoldson, and H. Sadar, eds.

Source: Ecological effects of in-situ sediments contaminants: proceedings of an international workshop, held in Aberystwyth, Wales, 1984, p. 189-199, maps.

Dordrecht: Dr. W. Junk, 1987.

Developments in hydrobiology 39.

Languages: English

Report No.: ISBN 906193639X

DNAL Call No.: TD223.3.E26

170

*Effects of inorganic and organic nutrient enrichment on growth and bioenergetics of the blue mussel, *Mytilus edulis* (Summary only).*

Tracey, G.A.

(Science Applications Int. Corp., c/o U.S. EPA, Narragansett, RI, USA)

Source: J. Shellfish Res. 1989 Annu. Meet. of the National Shellfisheries Association Los Angeles, CA (USA) 12 Feb 1989, vol. 7, no. 3, p. 562, (1988).

Languages: English

Document Type: CONFERENCE; SUMMARY; JOURNAL ARTICLE

Abstract: The effects of inorganic and organic enrichment on growth and bioenergetics of the blue mussel, *Mytilus edulis*, were experimentally tested. Matching additions of nutrients or sewage sludge over an 8-fold concentration range provided the potential for differing environmental conditions of water quality, food availability and food quality that might occur in marine waters receiving anthropogenic wastes. Growth of mussels within mesocosms declined with increased loading from both nutrient sources. Ingestion rates at equivalent food concentrations increased with increasing enrichment, thus counteracting food dilution effects. These results suggest that *M. edulis* can maintain food-proportional growth in environments widely varying in water and food quality.

Descriptors: mussel culture; growth; bioenergetics; environmental conditions; food availability

Taxonomic Descriptors: *Mytilus edulis*

Environment: MARINE

171

The effects of crude and fuel oils on the growth, chlorophyll 'a' content and dry matter production of a green alga Scenedesmus quadricauda (Turp.) Breb.

Tukaj, Z.

Source: Environmental pollution. Series A: Ecological and biological. Essex: Elsevier Applied Science. 1987, v. 47 (1) p. 9-24.

Languages: English

Report No.: ISSN 0143-1471

DNAL Call No.: QH545.A1E52

172

Estudos ecologicos do fitoplancton marinho e lacustre no Brasil: Situacao actual e perspectivas.

(Ecological studies on marine and lake phytoplankton in Brazil: Present situation and perspectives).

Tundisi, J.G.; Bicudo, C.E.M.; Teixeira, C.

Tundisi, J.G., eds.

(Univ. Sao Paulo, Esc. Eng. Sao Carlos, 13560 Sao Carlos, SP, Brazil)

Source: ALGAS: A ENERGIA DO AMANHA. Simp. Int. Algas: A Energia do Amanha; Sao Paulo (Brazil); 12 Jul 1982.

(ALGAE: ENERGY OF THE FUTURE.), 1986, pp. 27-48.

Languages: Portuguese English

Document Type: CONFERENCE; BIBLIOGRAPHY; BOOK

Abstract: The ecological research on phytoplankton communities during the last 30 years in Brazil is reviewed; three main topics were studied: 1) phytoplankton distribution and its relationships with hydrological features of estuaries, coastal and oceanic waters, lakes and reservoirs; 2) studies of primary production, light-photosynthesis responses, excretion of organic matter, and nutrient effects on growth and production. These processes were studied on a temporal and spatial scale; 3) phytoplankton culture (freshwater and marine in unialgal cultures), with the purpose of understanding more advanced ecophysiological processes under controlled conditions, and to measure the effects of pollutants on the growth, production and physiological responses of certain phytoplanktonic species.

Descriptors: phytoplankton; plankton surveys; environmental surveys; lakes; e estuaries; coastal waters; primary production; photosynthesis; nutrients (mineral); growth; phytoplankton culture; pollution effects; eutrophication; algal blooms; literature reviews

Geographic Descriptors: Brazil; ASW, Brazil

Taxonomic Descriptors: algae

Environment: MARINE; FRESH

173

Occurrence and distribution of Vibrio spp., Listonella spp., and Clostridium botulinum in the Seto Inland Sea of Japan.

Venkateswaran, K.; Nakano, H.; Okabe, T.; Takayama, K.; Matsuda, O.; Hashimoto, H.

(Dep. Food Microbiol. and Hyg., Fac. Appl. Biol. Sci., Hiroshima Univ., Higashi-Hiroshima 724, Japan)

Source: APPL. ENVIRON. MICROBIOL., vol. 55, no. 3, pp. 559-567, (1989).

Languages: English

Document Type: JOURNAL ARTICLE

Abstract: The distribution of *Vibrio* species in samples of surface water, bottom water (water 2 m above the sediments), and sediments from the Seto Inland Sea was studied. It was concluded that salinity indirectly governs the distribution of total vibrios and analysis of variance revealed that all bacterial populations were distributed homogeneously and the variance values were found to be significant in some water sampling regions. Of 26 sediments samples (12%), 3 harbored *C. botulinum* one was typed as C, while the toxin type of the other two could not be determined. All *C. botulinum* -positive samples were collected from inshore regions and riverine effluents would have influenced the higher incidence of clostridial spores. The present investigation concludes that there is considerable contamination with pathogenic organisms, which will challenge the inhabitants of the Seto Inland Sea, as well as their dependence on natural resources.

Descriptors: ecological distribution; salinity effects

Geographic Descriptors: Japan, Seto Inland Sea

Taxonomic Descriptors: *Vibrio*; *Listonella*; *Clostridium botulinum*

Environment: MARINE

174

Effects of bleached kraft mill effluent on early stages of brown trout (Salmo trutta L.).

Vuorinen, M.; Vuorinen, P.J.

(Finnish Game and Fish. Res. Inst., Fish. Div., Unioninkatu 45 B 42, SF-00170 Helsinki, Finland)

Source: ECOTOXICOL. ENVIRON. SAF., vol. 14, no. 2, pp. 117-128, (1987).

Languages: English

Summary Languages: English

Document Type: Journal Article

Abstract: Brown trout (*Salmo trutta* L.) eggs fertilized in clean water were incubated in bleached kraft mill effluent (BKME) concentration of 0, 0.5, 1, and 2% (v/v) in a continuous-flow system and exposure was continued with the sac fry for most of the yolk sac stage. In addition, sac fry first incubated in clean water were exposed after hatching to the same concentrations for 44 days. Percentage hatching was lower than in the control only in 2% BKME. In all the BKME concentrations, the newly hatched sac fry were shorter than the controls, and their heart rate was slower. All the sac fry in 2% BKME died within 3 weeks after the end of hatching. At the late yolk sac stage the sac fry in the other concentrations of BKME were shorter and less well developed than the controls. Their wet and dry weights were higher and their water content was lower because of retarded yolk absorption. Exposure commencing after hatching also caused retarded growth and development.

Descriptors: mortality; pulp wastes; fry; toxicity tests; lethal effects

Taxonomic Descriptors: *Salmo trutta*

Environment: Fresh

175

The role of estuaries in salmonid production.

Waldichuk, M.

Source: MAR. POLLUT. BULL., vol. 18, no. 11, pp. 571-572, (1987).

Languages: English

Document Type: Journal Article

Descriptors: biological production; estuaries; pollution effects; environmental impact

Taxonomic Descriptors: salmonidae

Environment: Marine

176

Batch and continuous culture experiments on nutrient limitations and temperature effects in the marine alga Tetraselmis suecica.

Weiss, V.; Gromet-Elhanan, Z.; Halmann, M.

Source: Water research. Oxford: Pergamon Press. 1985, v. 19 (2), p. 185-190, ill.

Languages: English

Report No.: ISSN 0043-1354

DNAL Call No.: TD420.W3

177

The effect of hydraulic retention time and duckweed cropping rate on nutrient removal from dairy barn wastewater.

Whitehead, A.J.; Lo, K.V.; Bulley, N.R.

(University of British Columbia, Vancouver, B.C., Canada)

K.R. Reddy and W.H. Smith, eds.

Source: Aquatic plants for water treatment and resource recovery. Orlando, Fla.: Magnolia Publishing Inc. 1987. p. 697-703.

Languages: English

Report No.: ISBN 0941463001

DNAL Call No.: TD475.C65 1986

178

Wastewater treatment in a wetland filter—effects of varying application frequency on nitrogen removal.

Wittgren, H.B.; Sundblad, K.

(Linköping University, Linköping, Sweden)

K.R. Reddy and W.H. Smith, eds.

Source: Aquatic plants for water treatment and resource recovery, Orlando, Fla.: Magnolia Publishing Inc., 1987, p. 513-523.

Languages: English

Report No.: ISBN 0941463001

DNAL Call No.: TD475.C65 1986

179

Effect of calcium on cadmium uptake and toxicity in larvae and juveniles of striped bass (Morone saxatilis).

Wright, D.A.; Meteyer, M.J.; Martin, F.D.

Source: Bulletin of environmental contamination and toxicology. New York, N.Y.: Springer-Verlag. Feb. 1985, v. 34 (2), p. 196-204.
Languages: English
Report No.: ISSN 0007-4861
DNAL Call No.: RA1270.P35A1

180

Impacts from sewage effluent on an open ocean shellfish farm. 1989 Annu. Meet. of the National shellfisheries Association Los Angeles, CA (USA) 12 Feb 1989.

Young, J.S.

(Pacific Seafood Industries, Inc., P.O. Box 2544, Santa Barbara, CA, USA)

Source: J. Shellfish Res., vol. 7, no. 3, p. 566, (1988).

Languages: English

Document Type: CONFERENCE; SUMMARY; JOURNAL ARTICLE

Abstract: The discharge of partially treated sewage effluent from sewage treatment plants (STP) into coastal waters can degrade the water quality of coastal resources. Non-disinfected sewage effluent contains pathogenic bacteria and viruses, and bivalves growing in contiguous receiving waters potentially concentrate these organisms. Commercial and sport-harvested shellfish used for human consumption are regulated by federal and state health institutions using fecal coliform bacteria (FC) as indicator organisms. Findings are presented along with a discussion of how oceanographic conditions, rainfall, and STP discharges work to adversely impact an offshore shellfish farm.

Descriptors: shellfish culture; sewage; pollution effects; water quality; marine pollution

Geographic Descriptors: INE, USA, California

Environment: MARINE

181

Mortalities of juvenile Atlantic salmon caused by the fungicide OBPA.

Zitko, V.; Burrige, L.E.; Woodside, M.; Jerome, V.

(Department of Fisheries and Oceans, St. Andrews, N.B. (Canada). Biol. Stn.)

Source: CAN. TECH. REP. FISH. AQUAT. SCI., no. 1358, 1985, 29 pp.

Languages: English

Summary Languages: English; French

Document Type: Report

Report No.: ISSN 0706-6457

Abstract: The most probable cause of the mortalities in salmo salar juveniles is the fungicide OBPA, 10,10'-oxybis-10H-phenoxarsine, present in a plastic liner of the fish tanks. Such a liner must not be used in aquaculture systems based on water recirculation and it is not recommended even in flow-through systems since chronic effects of OBPA are unknown and OBPA is not registered for this application. Results of the analyses of fish, fish food, and plastic liners for heavy metals and organic chemicals are described.

Descriptors: toxicity

Taxonomic Descriptors: aquaculture systems; mortality; salmo salar

Environment: Fresh

Identifiers: fungicides

[Late Entry]

Evaluation of aquaculture effluents: Final report.

Cichra, Charles E.; Shireman, Jerome V.

(Department of Fisheries and Aquaculture, University of Florida, Gainesville, Florida 32606)

Source: Aquaculture Report Series. Florida Department of Agriculture & Consumer Services, Division of Marketing. Dec. 13, 1990, 139 pp., + appendices.

Languages: English

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